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Report On

FCC Testing of the
Ericsson Remote Radio Unit Dot 2256/2266 B48B41B25B66 KRY 901
537/1, KRY 901 537/2, NR + LTE (2600 MHz) Base Station in
accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27.

COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRY901537-1 & TA8AKRY901537-2

PREPARED BY

Handwritten signature of Glen Westwell.

Glen Westwell
Senior Test Engineer

APPROVED BY

Handwritten signature of Scott Drysdale.

Scott Drysdale
Authorised Signatory

DATED

19 January 2023

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SECTION 1

REPORT INFORMATION



1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name & Product Number	Dot 2266 B48B41B25B66 - KRY 901 537/2
Serial Number(s)	TD3W388627
Software Version	CXP 203 0045/26 - R15A701
Hardware Version	R1B
Non-Tested Variant (See Section 1.10 Additional Information)	Dot 2256 B48B41B25B66 - KRY 901 537/1
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2021 FCC CFR 47 Part 27: 2021
Test Plan	RA FCC Test Plan Dot 2266 B48B41B25B66_forTUV_25Nov2022
Start of Test	30-November-2022
Finish of Test	12-December-2022
Name of Engineer(s)	Glen Westwell
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 ANSI C63.26-2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate compliance with and FCC CFR 47 Part 2: 2021, FCC CFR 47 Part 27: 2021. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Glen Westwell



1.2 BRIEF SUMMARY OF RESULTS

The tests that have been selected are detailed in the customer Test Plan as defined in section 1.1 of this report. The Test Plan is based on the TÜV SÜD FCC Test Plan Rationale, available on request.

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27 is shown below.

Section	Specification Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 27		
2.1	2.1046	27.50	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	27.53	Occupied Bandwidth	Pass
2.3	2.1051	27.53	Band Edge	Pass
2.4	2.1051	27.53	Transmitter Spurious Emissions	Pass
2.5	2.1055	-	Frequency Stability	Pass

Testing in this Report covers only B41 (2496-2690 MHz)



1.3 TEST RATIONALE

The tests that have been selected are detailed in the customer Test Plan as defined in section 1.1 of this report. The Test Plan is based on the TÜV SÜD FCC Test Plan Rationale, available on request.



1.4 CONFIGURATION DESCRIPTION

Configuration A					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	1	5 MHz	2498.5	2593	2687.5
		10 MHz	2501	2593	2685
		15 MHz	2503.5	2593	2682.5
		20 MHz	2506	2593	2680
NR	1	10 MHz	2501	2593	2685
		15 MHz	2503.5	2593	2682.5
		20 MHz	2506	2593	2680
		30 MHz	2511	2593	2675
		40 MHz	2516	2593	2670
		50 MHz	2521	2593	2665
		60 MHz	2526	2593	2660
		70 MHz	2531	2593	2655
		80 MHz	2536	2593	2650
		90 MHz	2541	2593	2645
100 MHz	2546	2593	2640		

Configuration B Contiguous Channel Allocations					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	2	5+5 MHz	2498.5+2503.5	2590.5+2595.5	2682.5+2687.5
		20+20 MHz	2506+2526	2583+2603	2660+2680
NR	2	10+10 MHz	2501+2511	2588+2598	2675+2685
		90+90 MHz	2541+2631	2548+2638	2555+2645
NR10+LTE5	2	10+5 MHz	2501+2508.5	2590.5+2598	2680+2687.5

Configuration B Non-Contiguous Channel Allocations					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR10+LTE5	2	10+5 MHz	2501+2687.5	2501+2687.5	2501+2687.5



Configuration C Contiguous Channel Allocations					
RAT	No. of Carriers	Carrier BW	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	6	5 MHz	2498.5+2503.5+2508.5	2580.5+2585.5+2590.5+	2662.5+2667.5+2672.5
			2513.5+2518.5+2523.5	2595.5+2600.5+2605.5	2677.5+2682.5+2687.5
		20 MHz	2506+2526+2646+	2543+2563+2583	2580+2600+2620+
			2666+2686+2706	2603+2623+2643	2640+2660+2680
NR	6	10 MHz	2501+2511+2521+	2568+2578+2588+	2635+2645+2655+
			2531+2541+2551	2598+2608+2618	2665+2675+2685
NR	6	20 MHz	2506+2526+2646+	2543+2563+2583	2580+2600+2620+
			2666+2686+2706	2603+2623+2643	2640+2660+2680
3NR10+3LTE5	6	10+5 MHz	2501+2511+2521+	2575.5+2585.5+2595.5+	2650+2660+2670+
			2528.5+2533.5+2538.5	2603+2608+2613	2677.5+2682.5+2687.5

Configuration C Non-Contiguous Channel Allocations					
RAT	No. of Carriers	Carrier BW	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
3NR10+3LTE5	6	10+5 MHz	2501+2511+2521+	2501+2511+2521+	2501+2511+2521+
			2677.5+2682.5+2687.5	2677.5+2682.5+2687.5	2677.5+2682.5+2687.5



1.5 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Dot
MANUFACTURER	Ericsson
TYPE	Remote Radio Base Station
PART NUMBER	KRY 901 537/1 and KRY 901 537/2
SERIAL NUMBER	TD3W388627 for Dot 2266 B48B41B25B66 TD3W340089 for Dot 4455 B77DB25B66
HARDWARE VERSION	R1B for Dot 2266 B48B41B25B66 (used for B41 tests) R1A modified as R1B for Dot 4465 B77DB25B66 (used for B25 & B66 tests)
SOFTWARE VERSION	CXP 203 0045/26 - R15A701 for Dot 2266 B48B41B25B66 CXP 203 0045/26 - R14BX12 for Dot 4455 B77DB25B66
TRANSMITTER OPERATING RANGE	B41: 2496-2690MHz B25: 1930-1995MHz B66: 2110-2200MHz
RECEIVER OPERATING RANGE	B41: 2496-2690MHz B25: 1850-1915MHz B66: 1710-1780MHz
COUNTRY OF ORIGIN	China
INTERMEDIATE FREQUENCIES	None
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	B41 NR: 10M0F9W, 20M0F9W, 30M0F9W, 40M0F9W, 50M0F9W, 60M0F9W, 70M0F9W 80M0F9W, 90M0F9W, 100M0F9W B41 LTE: 5M00W7D, 10M0W7D, 15M0W7D, 20M0W7D B25 NR: 10M0F9W, 15M0F9W, 20M0F9W +NBioT B25 NR: 5M00F9W, 25M0F9W, 30M0F9W, 40M0F9W B25 LTE: 5M00W7D, 10M0W7D, 15M0W7D, 20M0W7D +NBioT B66 NR: 10M0F9W, 15M0F9W, 20M0F9W +NBioT B66 NR: 5M00F9W, 25M0F9W, 30M0F9W, 40M0F9W B66 LTE: 5M00W7D, 10M0W7D, 15M0W7D, 20M0W7D +NBioT
MODULATION TYPES: (i.e. GMSK, QPSK)	NR: QPSK, 16QAM, 64QAM, 256QAM LTE: QPSK, 16QAM, 64QAM, 256QAM
HIGHEST INTERNALLY GENERATED FREQUENCY	2.70 GHz
OUTPUT POWER (W or dBm)	B41: 2 x 0.4W (26dBm) (1 carrier limited to 24dBm) B25: 2 x 0.2W (23dBm) B66: 2 x 0.2W (23dBm)
Antenna gain (dBi)	B41: 4.4 dBi B25: 4.2 dBi B66: 4.7 dBi
FCC ID	TA8AKRY901537-1 & TA8AKRY901537-2



INDUSTRY CANADA ID	NA
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Dot 2256 B48B41B25B66 (KRY 901 537/1) and Dot 2266 B48B41B25B66 (KRY 901 537/2) are Remote Radio Units forming part of the Ericsson Radio Base Station (RBS) equipment. The Dot provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 6 Transmit ports in MRO (NR+LTE);Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output up to 0.4W per port over an operational temperature of 5°C to +40°C. The unit is designed to be ceiling or wall mounted. The 2256 and 2266 radios are identical except that Dot 2256 has internal antennas and Dot 2266 has external RF ports.

Signature

.....

Denis Lalonde

Date: 9 January 2023

**Declaration of Build Status Serial
Number: TD3W388627**

No responsibility will be accepted by TÜV SÜD as to the accuracy of the information declared in this document by the manufacturer.



1.6 PRODUCT INFORMATION

1.6.1 Technical Description

The Equipment Under Test (EUT) Dot 2266 B48B41B25B66 - KRY 901 537/2 is an Ericsson AB Radio Unit working in the public mobile service Band 41 band which provides communication connections to Band 41 network.

The EUT is declared as operating from a nominal -48V DC supply.

The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.

Equipment Under Test

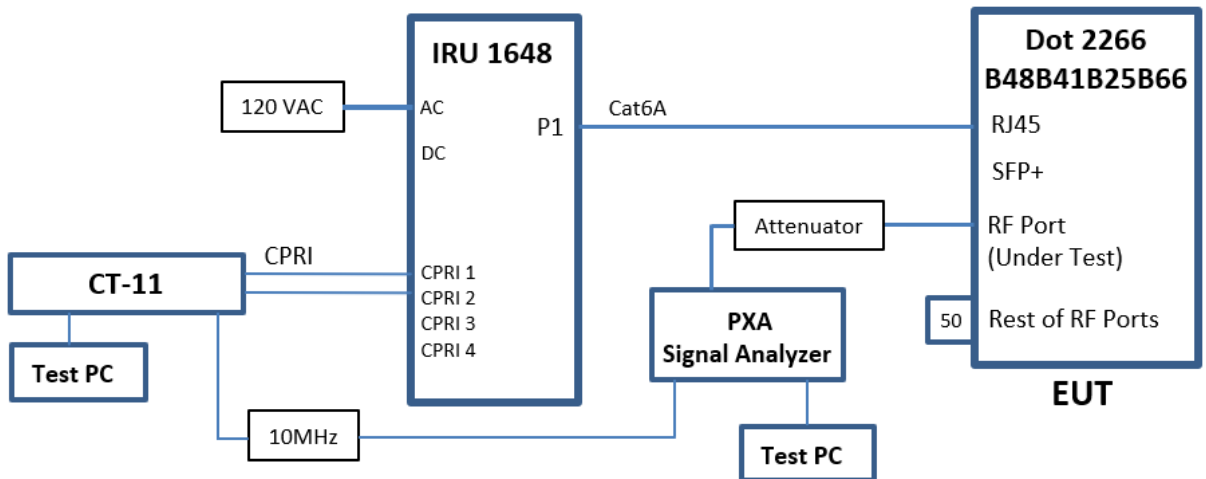




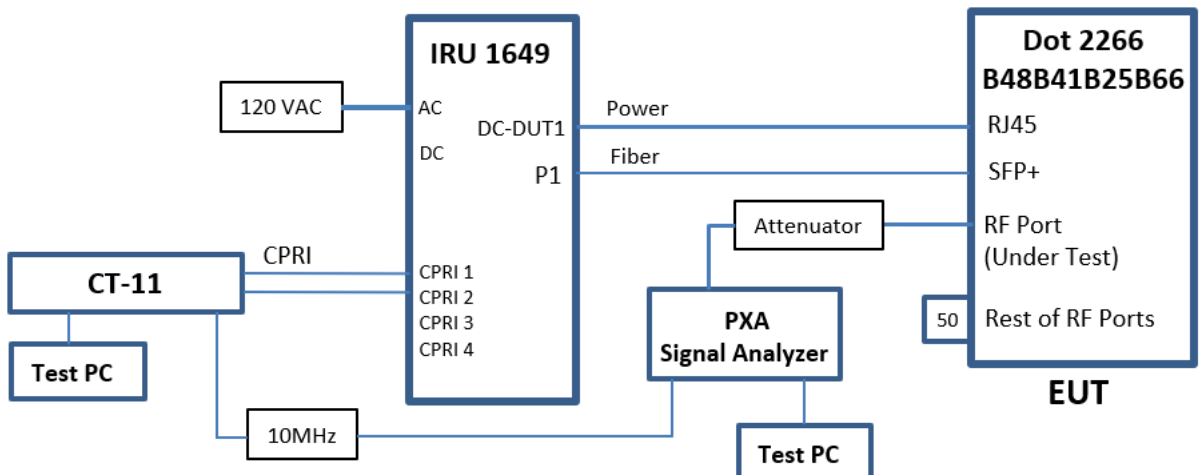
1.7 TEST SETUP

Conducted Test Set Up

Contiguous Configuration

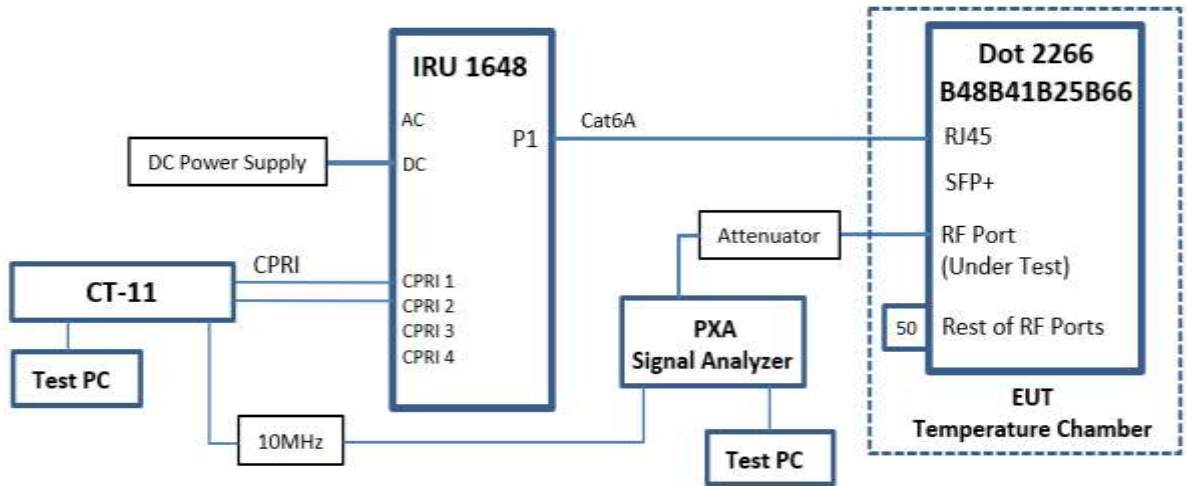


Non-Contiguous Configuration





Conducted Test Set Up – Frequency Stability
Dashed line indicates equipment inside the Temperature Chamber for testing





Test Conditions

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated as described in the Test Method for each Test.

The EUT was powered from a -54V DC supply unless otherwise stated.

FCC Measurement Facility Registration Number
CA4810 TUV SUD Canada, 1280 Teron Rd., Kanata On.

Under our A2LA Accreditation, TÜV SÜD Canada conducted the following tests Ericsson, Ottawa Laboratory: 349 Terry Fox Dr, Kanata, ON.

Test Name	Name of Engineer(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Glen Westwell
Occupied Bandwidth	Glen Westwell
Band Edge	Glen Westwell
Transceiver Spurious Emissions	Glen Westwell
Freq. Stab.	Glen Westwell

1.8 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.9 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.10 ADDITIONAL INFORMATION

1. This filing is for a Radio Certification for use in the USA under the following ID's:

FCC ID: TA8AKRY901537-1 & TA8AKRY901537-2

2. Transmitter performance was measured for top, mid & bottom channels, where applicable, across all antenna ports as presented in the average power measurement tables. Typical performance is presented.



SECTION 2

TEST DETAILS



2.1 MAXIMUM PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.50
FCC CFR 47 Part 2, Clause 2.1046

2.1.2 Date of Test and Modification State

01 and 12-December-2022 - Modification State 0

2.1.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.4 Environmental Conditions

Ambient Temperature	24.7 - 25.0°C
Relative Humidity	31.7 - 33.1%

2.1.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01.

2.1.6 Test Results



Configuration A

Maximum Output Power 24.00 dBm / Port

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
			Antenna Port	PAR (dB)	Channel Position B		
Average Power							
4.40				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz
4A	LTE: QPSK	5.0 MHz	10.03	22.65	27.05	16.57	20.97
4B	LTE: QPSK	5.0 MHz	-	22.46	26.86	16.57	20.97
Total			-	25.57	29.97	19.58	23.98
4A	LTE: QPSK	10.0 MHz	9.96	22.60	27.00	14.01	18.41
4B	LTE: QPSK	10.0 MHz	-	22.38	26.78	14.01	18.41
Total			-	25.50	29.90	17.02	21.42
4A	LTE: QPSK	15.0 MHz	9.33	22.30	26.70	11.57	15.97
4B	LTE: QPSK	15.0 MHz	-	22.02	26.42	11.57	15.97
Total			-	25.17	29.57	14.58	18.98
4A	LTE: QPSK	20.0 MHz	9.63	22.25	26.65	10.32	14.72
4B	LTE: QPSK	20.0 MHz	-	22.15	26.55	10.32	14.72
Total			-	25.21	29.61	13.33	17.73
4A	NR: QPSK	10.0 MHz	9.82	22.78	27.18	14.00	18.40
4B	NR: QPSK	10.0 MHz	-	22.59	26.99	14.00	18.40
Total			-	25.70	30.10	17.01	21.41
4A	NR: QPSK	20.0 MHz	9.51	23.01	27.41	11.04	15.44
4B	NR: QPSK	20.0 MHz	-	22.71	27.11	11.04	15.44
Total			-	25.87	30.27	14.05	18.45
4A	NR: QPSK	30.0 MHz	9.69	22.95	27.35	9.43	13.83
4B	NR: QPSK	30.0 MHz	-	22.78	27.18	9.43	13.83
Total			-	25.88	30.28	12.44	16.84
4A	NR: QPSK	40.0 MHz	9.35	22.94	27.34	8.09	12.49
4B	NR: QPSK	40.0 MHz	-	22.84	27.24	8.09	12.49
Total			-	25.90	30.30	11.10	15.50
4A	NR: QPSK	50.0 MHz	9.67	23.15	27.55	7.48	11.88
4B	NR: QPSK	50.0 MHz	-	23.04	27.44	7.48	11.88
Total			-	26.11	30.51	10.49	14.89
4A	NR: QPSK	60.0 MHz	9.48	23.19	27.59	6.90	11.30
4B	NR: QPSK	60.0 MHz	-	23.13	27.53	6.90	11.30
Total			-	26.17	30.57	9.91	14.31
4A	NR: QPSK	70.0 MHz	9.62	23.35	27.75	6.00	10.40
4B	NR: QPSK	70.0 MHz	-	23.17	27.57	6.00	10.40
Total			-	26.27	30.67	9.01	13.41
4A	NR: QPSK	80.0 MHz	9.48	23.37	27.77	5.44	9.84
4B	NR: QPSK	80.0 MHz	-	23.18	27.58	5.44	9.84
Total			-	26.29	30.69	8.45	12.85
4A	NR: QPSK	90.0 MHz	9.89	23.43	27.83	4.71	9.11
4B	NR: QPSK	90.0 MHz	-	23.20	27.60	4.71	9.11
Total			-	26.33	30.73	7.72	12.12
4A	NR: QPSK	100.0 MHz	9.15	23.28	27.68	4.31	8.71
4B	NR: QPSK	100.0 MHz	-	23.12	27.52	4.31	8.71
Total			-	26.21	30.61	7.32	11.72



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power					
			Antenna Port	PAR (dB)	Channel Position M			
					Average Power			
4.40				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz	
4A	LTE: QPSK	5.0 MHz	9.80	23.30	27.70	17.14	21.54	
4B	LTE: QPSK	5.0 MHz	-	22.93	27.33	17.14	21.54	
Total			-	26.13	30.53	20.15	24.55	
4A	LTE: QPSK	10.0 MHz	10.50	23.35	27.75	14.55	18.95	
4B	LTE: QPSK	10.0 MHz	-	23.00	27.40	14.55	18.95	
Total			-	26.19	30.59	17.56	21.96	
4A	LTE: QPSK	15.0 MHz	9.91	23.00	27.40	12.16	16.56	
4B	LTE: QPSK	15.0 MHz	-	22.73	27.13	12.16	16.56	
Total			-	25.88	30.28	15.17	19.57	
4A	LTE: QPSK	20.0 MHz	9.92	22.82	27.22	10.83	15.23	
4B	LTE: QPSK	20.0 MHz	-	22.72	27.12	10.83	15.23	
Total			-	25.78	30.18	13.84	18.24	
4A	NR: QPSK	10.0 MHz	9.53	23.67	28.07	14.89	19.29	
4B	NR: QPSK	10.0 MHz	-	23.42	27.82	14.89	19.29	
Total			-	26.56	30.96	17.90	22.30	
4A	NR: QPSK	20.0 MHz	9.64	23.68	28.08	11.58	15.98	
4B	NR: QPSK	20.0 MHz	-	23.39	27.79	11.58	15.98	
Total			-	26.55	30.95	14.59	18.99	
4A	NR: QPSK	30.0 MHz	9.23	23.34	27.74	9.85	14.25	
4B	NR: QPSK	30.0 MHz	-	23.25	27.65	9.85	14.25	
Total			-	26.31	30.71	12.86	17.26	
4A	NR: QPSK	40.0 MHz	9.46	23.42	27.82	8.55	12.95	
4B	NR: QPSK	40.0 MHz	-	23.23	27.63	8.55	12.95	
Total			-	26.34	30.74	11.56	15.96	
4A	NR: QPSK	50.0 MHz	9.38	23.52	27.92	7.74	12.14	
4B	NR: QPSK	50.0 MHz	-	23.30	27.70	7.74	12.14	
Total			-	26.42	30.82	10.75	15.15	
4A	NR: QPSK	60.0 MHz	9.54	23.57	27.97	6.87	11.27	
4B	NR: QPSK	60.0 MHz	-	23.36	27.76	6.87	11.27	
Total			-	26.48	30.88	9.88	14.28	
4A	NR: QPSK	70.0 MHz	9.45	23.50	27.90	6.12	10.52	
4B	NR: QPSK	70.0 MHz	-	23.32	27.72	6.12	10.52	
Total			-	26.42	30.82	9.13	13.53	
4A	NR: QPSK	80.0 MHz	9.35	23.70	28.10	5.71	10.11	
4B	NR: QPSK	80.0 MHz	-	23.39	27.79	5.71	10.11	
Total			-	26.56	30.96	8.72	13.12	
4A	NR: QPSK	90.0 MHz	9.48	23.59	27.99	4.94	9.34	
4B	NR: QPSK	90.0 MHz	-	23.26	27.66	4.94	9.34	
Total			-	26.44	30.84	7.95	12.35	
4A	NR: QPSK	100.0 MHz	9.74	23.58	27.98	4.70	9.10	
4B	NR: QPSK	100.0 MHz	-	23.39	27.79	4.70	9.10	
Total			-	26.50	30.90	7.71	12.11	



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
			PAR (dB)	Channel Position T			
				Average Power			
Antenna Port				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz
4.40							
4A	LTE: QPSK	5.0 MHz	9.60	23.68	28.08	17.67	22.07
4B	LTE: QPSK	5.0 MHz	-	23.49	27.89	17.67	22.07
Total			-	26.60	31.00	17.67	22.07
4A	LTE: QPSK	10.0 MHz	10.12	23.55	27.95	14.86	19.26
4B	LTE: QPSK	10.0 MHz	-	23.46	27.86	14.86	19.26
Total			-	26.52	30.92	17.87	22.27
4A	LTE: QPSK	15.0 MHz	9.47	23.17	27.57	12.23	16.63
4B	LTE: QPSK	15.0 MHz	-	23.12	27.52	12.23	16.63
Total			-	26.16	30.56	15.24	19.64
4A	LTE: QPSK	20.0 MHz	9.55	23.09	27.49	11.04	15.44
4B	LTE: QPSK	20.0 MHz	-	22.96	27.36	11.04	15.44
Total			-	26.04	30.44	14.05	18.45
4A	NR: QPSK	10.0 MHz	9.62	23.95	28.35	15.05	19.45
4B	NR: QPSK	10.0 MHz	-	23.84	28.24	15.05	19.45
Total			-	26.91	31.31	18.06	22.46
4A	NR: QPSK	20.0 MHz	9.65	23.93	28.33	12.11	16.51
4B	NR: QPSK	20.0 MHz	-	23.79	28.19	12.11	16.51
Total			-	26.87	31.27	15.12	19.52
4A	NR: QPSK	30.0 MHz	9.42	23.73	28.13	10.34	14.74
4B	NR: QPSK	30.0 MHz	-	23.61	28.01	10.34	14.74
Total			-	26.68	31.08	13.35	17.75
4A	NR: QPSK	40.0 MHz	9.51	23.71	28.11	8.87	13.27
4B	NR: QPSK	40.0 MHz	-	23.61	28.01	8.87	13.27
Total			-	26.67	31.07	11.88	16.28
4A	NR: QPSK	50.0 MHz	9.39	23.77	28.17	8.08	12.48
4B	NR: QPSK	50.0 MHz	-	23.63	28.03	8.08	12.48
Total			-	26.71	31.11	11.09	15.49
4A	NR: QPSK	60.0 MHz	9.50	23.80	28.20	7.25	11.65
4B	NR: QPSK	60.0 MHz	-	23.63	28.03	7.25	11.65
Total			-	26.73	31.13	10.26	14.66
4A	NR: QPSK	70.0 MHz	9.81	23.88	28.28	6.66	11.06
4B	NR: QPSK	70.0 MHz	-	23.58	27.98	6.66	11.06
Total			-	26.74	31.14	9.67	14.07
4A	NR: QPSK	80.0 MHz	9.69	23.96	28.36	6.01	10.41
4B	NR: QPSK	80.0 MHz	-	23.55	27.95	6.01	10.41
Total			-	26.77	31.17	9.02	13.42
4A	NR: QPSK	90.0 MHz	9.72	23.92	28.32	5.30	9.70
4B	NR: QPSK	90.0 MHz	-	23.55	27.95	5.30	9.70
Total			-	26.75	31.15	8.31	12.71
4A	NR: QPSK	100.0 MHz	9.39	23.82	28.22	4.74	9.14
4B	NR: QPSK	100.0 MHz	-	23.50	27.90	4.74	9.14
Total			-	26.67	31.07	7.75	12.15

Remarks

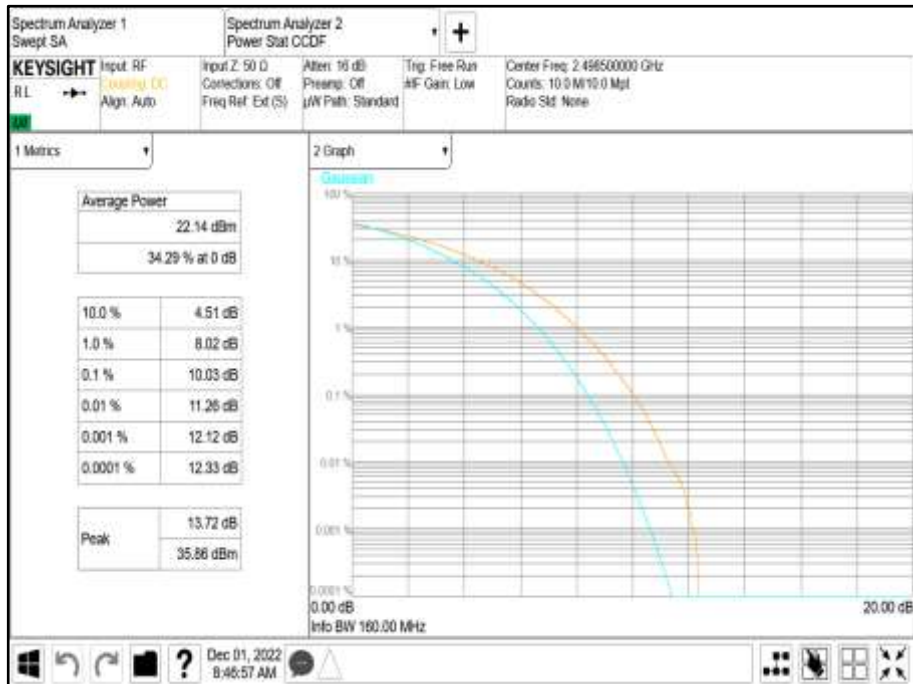
1. Transmitter performance has been presented for top, mid, bottom channels across all antenna ports as represented in the following tables.
2. Typical performance and measurement plot data has been presented for reference.
3. All plot data is on file and available upon request.



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B





Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

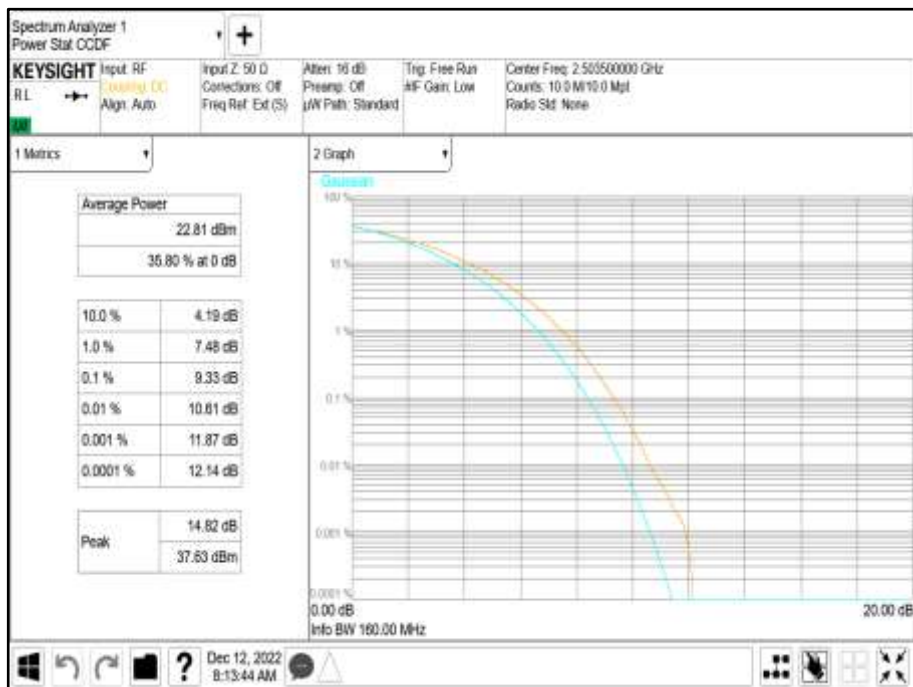




Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B

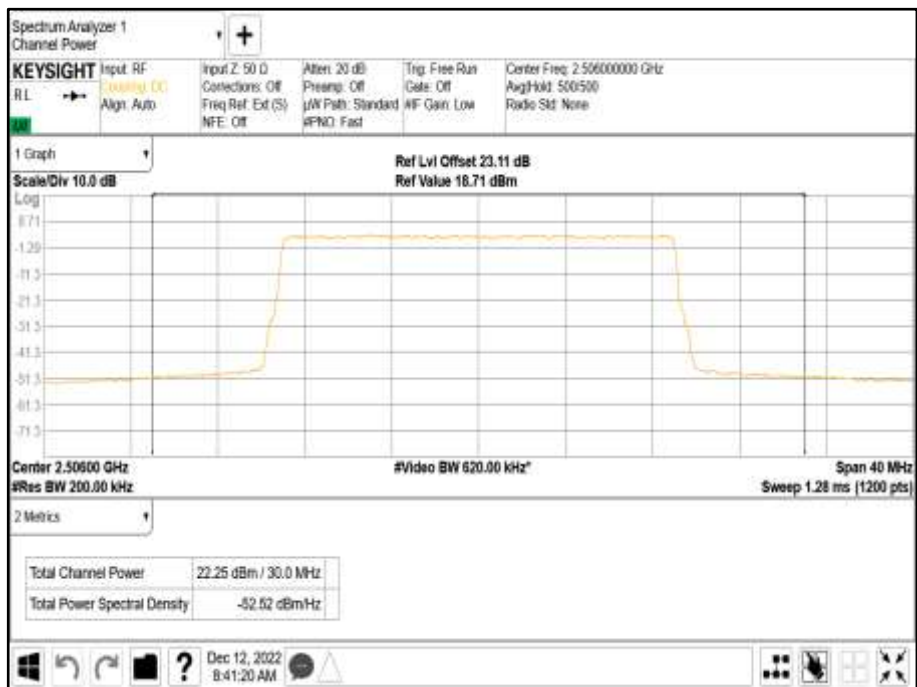




Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B

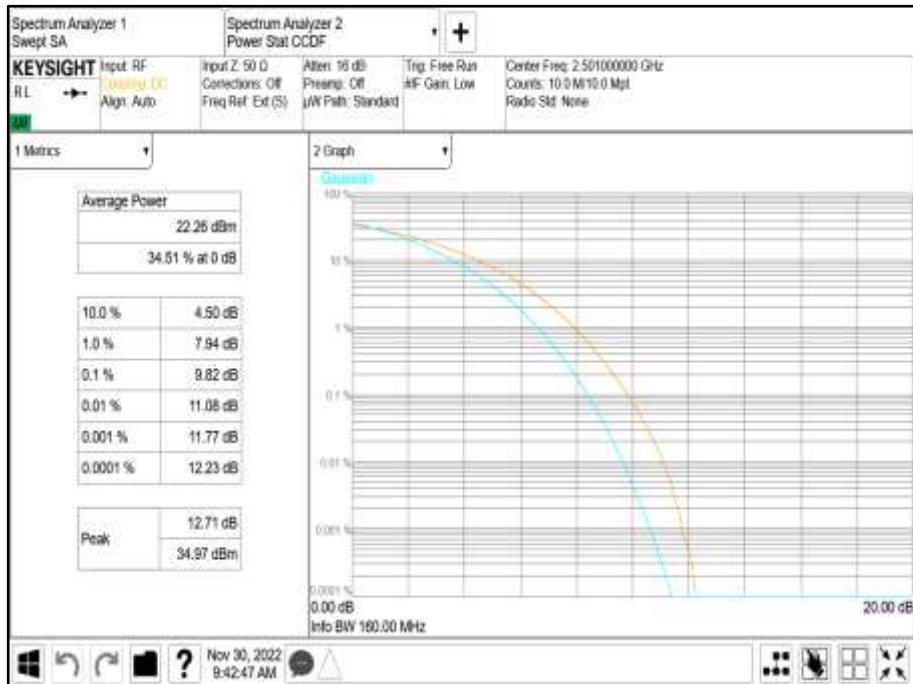




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B





Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B

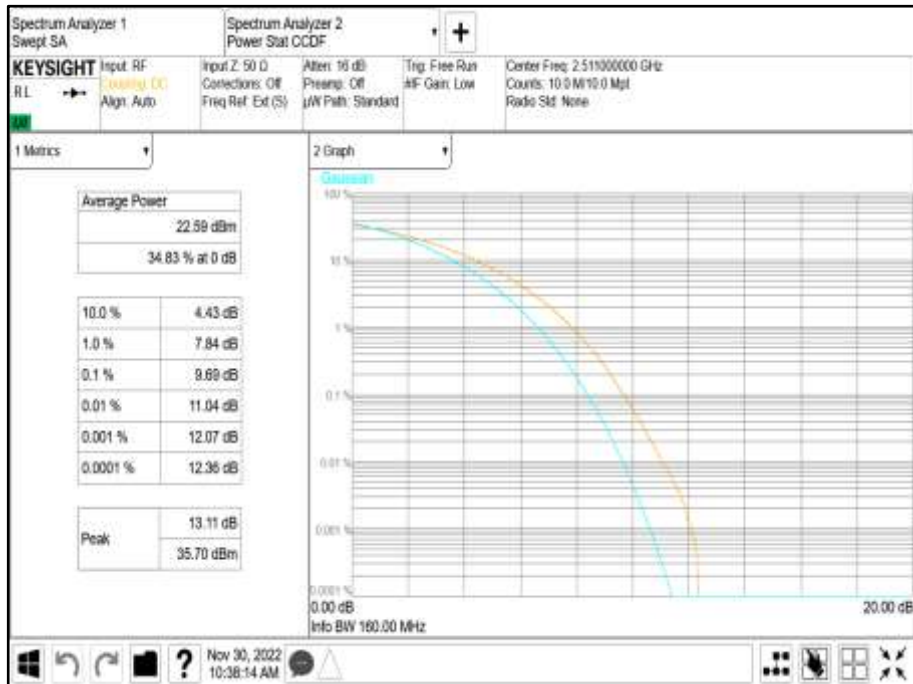




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 30.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 30.0 MHz - Channel Position B





Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 30.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 40.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 40.0 MHz - Channel Position B



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 40.0 MHz - Channel Position B

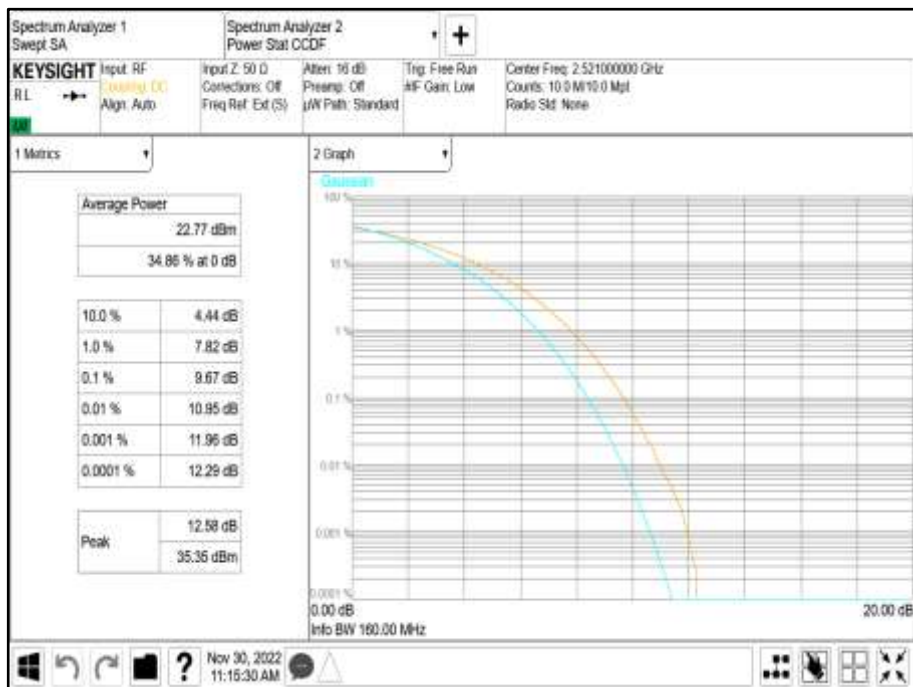




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 50.0 MHz - Channel Position B

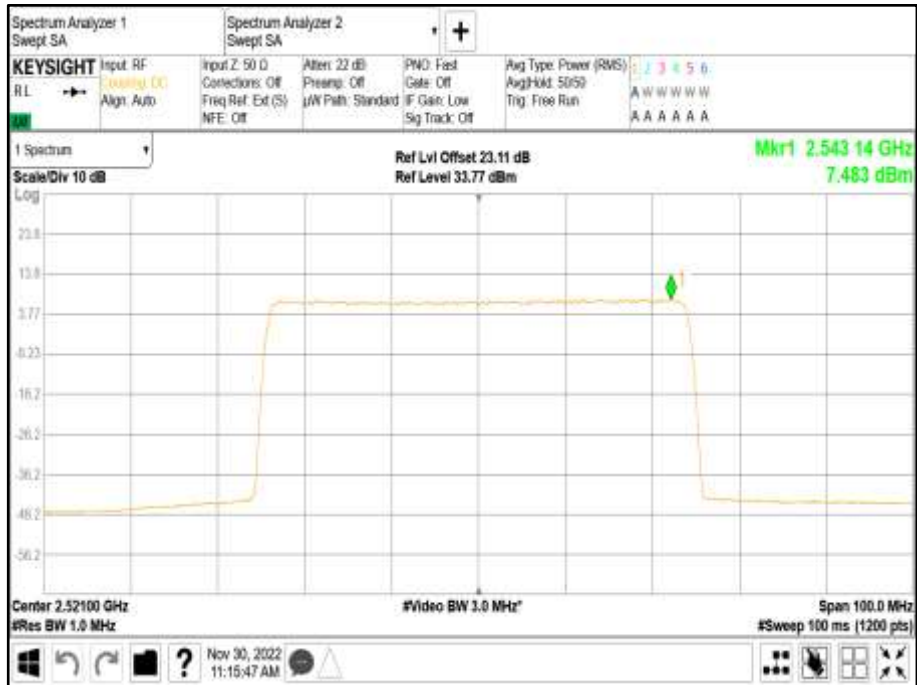


Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 50.0 MHz - Channel Position B





Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 50.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 60.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 60.0 MHz - Channel Position B



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 60.0 MHz - Channel Position B

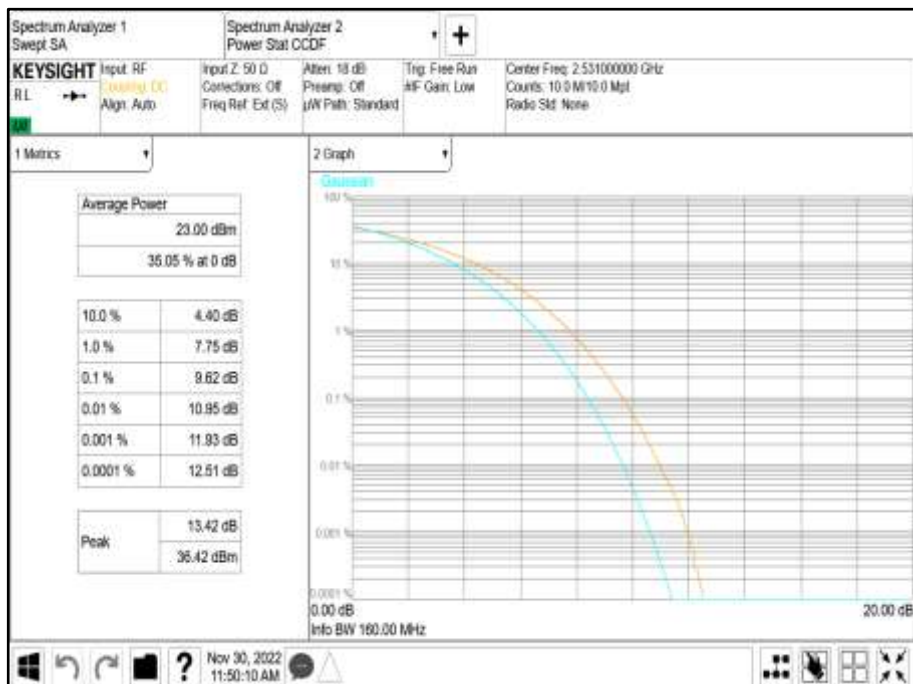




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 70.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 70.0 MHz - Channel Position B





Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 70.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 80.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 80.0 MHz - Channel Position B



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 80.0 MHz - Channel Position B

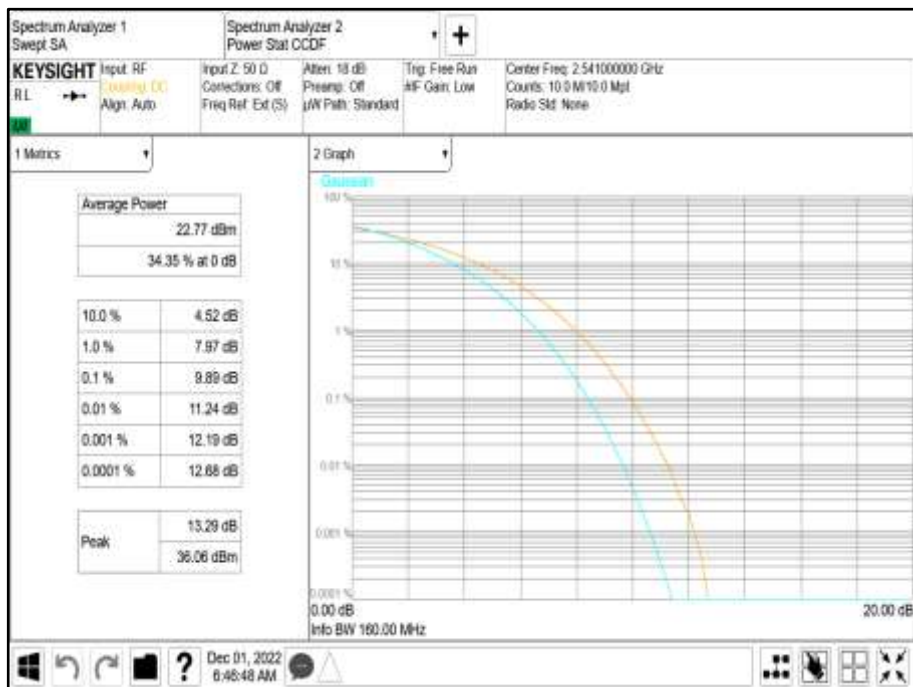




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 90.0 MHz - Channel Position B



Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 90.0 MHz - Channel Position B

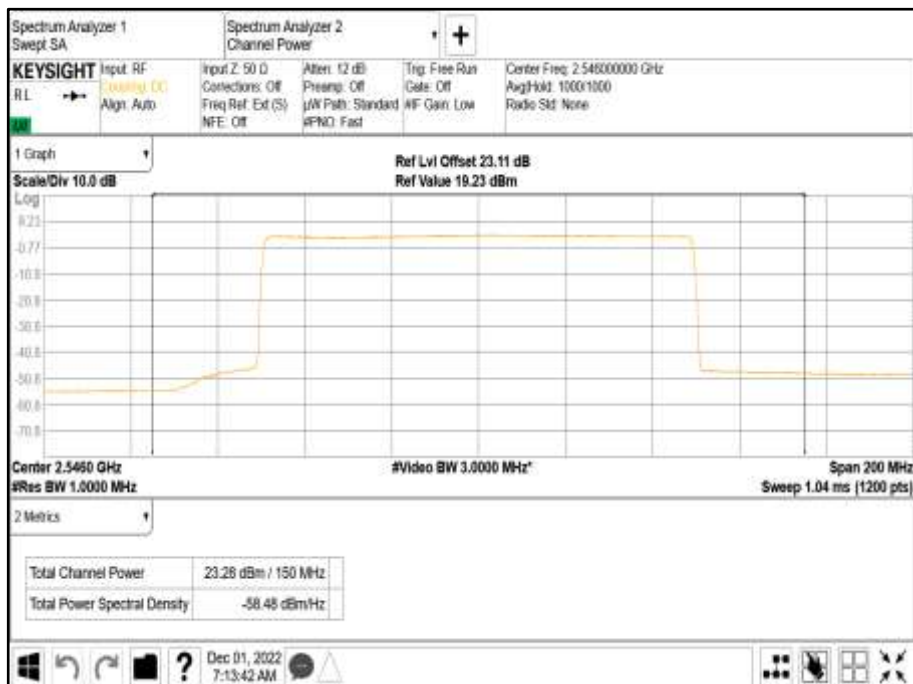




Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 90.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 100.0 MHz - Channel Position B





Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 100.0 MHz - Channel Position B



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 100.0 MHz - Channel Position B





Configuration B

Maximum Output Power 26.00 dBm / Port

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power	
			Channel Position B	
			Average Power (dBm)	
Antenna Port			dBm	EIRP (dBm)
4.40				
4A	LTE5: QPSK	L5.0+L5.0 MHz	24.30	28.70
4B	LTE5: QPSK	L5.0+L5.0 MHz	24.03	28.43
Total			27.18	31.58
4A	LTE20: QPSK	L20.0+L20.0 MHz	24.49	28.89
4B	LTE20: QPSK	L20.0+L20.0 MHz	24.20	28.60
Total			27.36	31.76
4A	NR10: QPSK	NR10+NR10 MHz	25.11	29.51
4B	NR10: QPSK	NR10+NR10 MHz	24.92	29.32
Total			28.03	32.43
4A	NR90: QPSK	NR90+NR90 MHz	25.49	29.89
4B	NR90: QPSK	NR90+NR90 MHz	25.28	29.68
Total			28.40	32.80
4A	NR10+LTE5: QPSK	NR10+L5 MHz	24.42	28.82
4B	NR10+LTE5: QPSK	NR10+L5 MHz	23.76	28.16
Total			27.11	31.51
4A	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.31	28.71
4B	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.11	28.51
Total			27.22	31.62

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power	
			Channel Position M	
			Average Power (dBm)	
Antenna Port			dBm	EIRP (dBm)
4.40				
4A	LTE5: QPSK	L5.0+L5.0 MHz	24.86	29.26
4B	LTE5: QPSK	L5.0+L5.0 MHz	24.62	29.02
Total			27.75	32.15
4A	LTE20: QPSK	L20.0+L20.0 MHz	24.87	29.27
4B	LTE20: QPSK	L20.0+L20.0 MHz	24.60	29.00
Total			27.75	32.15
4A	NR10: QPSK	NR10+NR10 MHz	25.79	30.19
4B	NR10: QPSK	NR10+NR10 MHz	25.47	29.87
Total			28.64	33.04
4A	NR90: QPSK	NR90+NR90 MHz	25.58	29.98
4B	NR90: QPSK	NR90+NR90 MHz	25.32	29.72
Total			28.46	32.86
4A	NR10+LTE5: QPSK	NR10+L5 MHz	24.41	28.81
4B	NR10+LTE5: QPSK	NR10+L5 MHz	24.36	28.76
Total			27.40	31.80
4A	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.31	28.71
4B	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.11	28.51
Total			27.22	31.62



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power	
			Channel Position T	
4.40			Average Power (dBm)	
Antenna Port			dBm	EIRP (dBm)
4A	LTE5: QPSK	L5.0+L5.0 MHz	25.12	29.52
4B	LTE5: QPSK	L5.0+L5.0 MHz	24.89	29.29
Total			28.02	32.42
4A	LTE20: QPSK	L20.0+L20.0 MHz	25.00	29.40
4B	LTE20: QPSK	L20.0+L20.0 MHz	24.82	29.22
Total			27.92	32.32
4A	NR10: QPSK	NR10+NR10 MHz	25.95	30.35
4B	NR10: QPSK	NR10+NR10 MHz	25.84	30.24
Total			28.91	33.31
4A	NR90: QPSK	NR90+NR90 MHz	25.43	29.83
4B	NR90: QPSK	NR90+NR90 MHz	25.42	29.82
Total			28.44	32.84
4A	NR10+LTE5: QPSK	NR10+L5 MHz	25.04	29.44
4B	NR10+LTE5: QPSK	NR10+L5 MHz	24.42	28.82
Total			27.75	32.15
4A	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.31	28.71
4B	* NR10+LTE5: QPSK	* NR10+L5 MHz	24.11	28.51
Total			27.22	31.62

Remarks

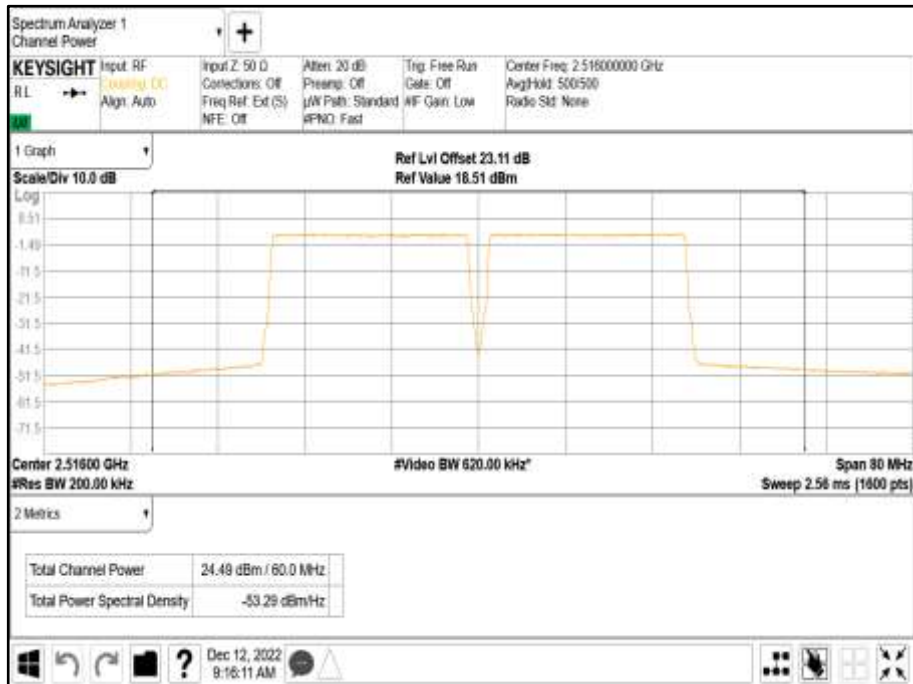
1. The table results are measured at all antenna ports, worst-case performance presented.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels are available on request.
- 4 * indicates a Non-Contiguous (NC) configuration.



Antenna Port A Carrier Power - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation LTE20: QPSK - Carrier Bandwidth L20.0+L20.0 MHz - Channel Position B





Antenna Port A Carrier Power - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position B

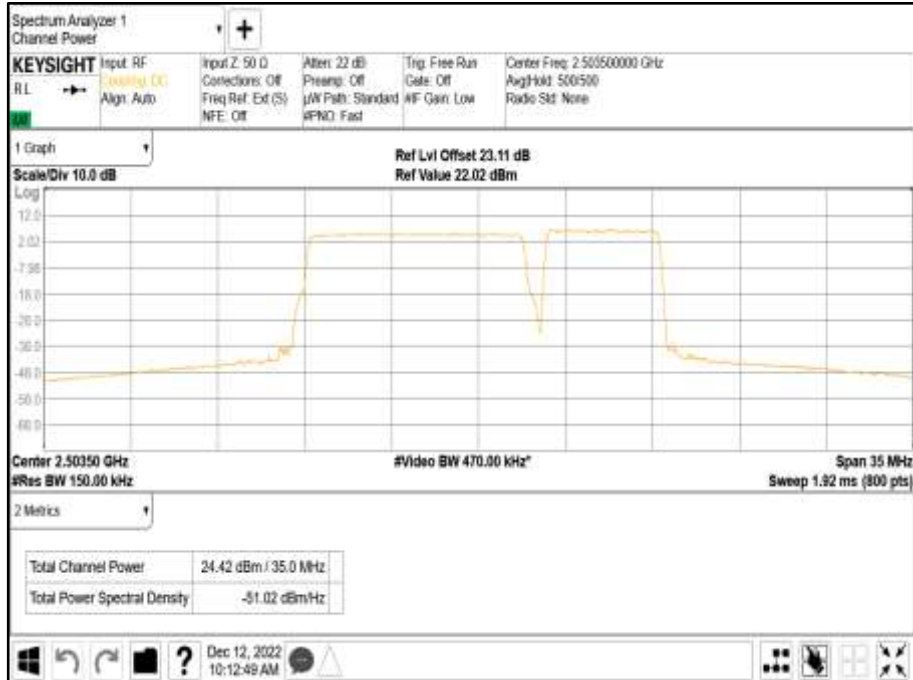


Antenna Port A Carrier Power - Modulation NR90: QPSK - Carrier Bandwidth NR90+NR90 MHz - Channel Position B

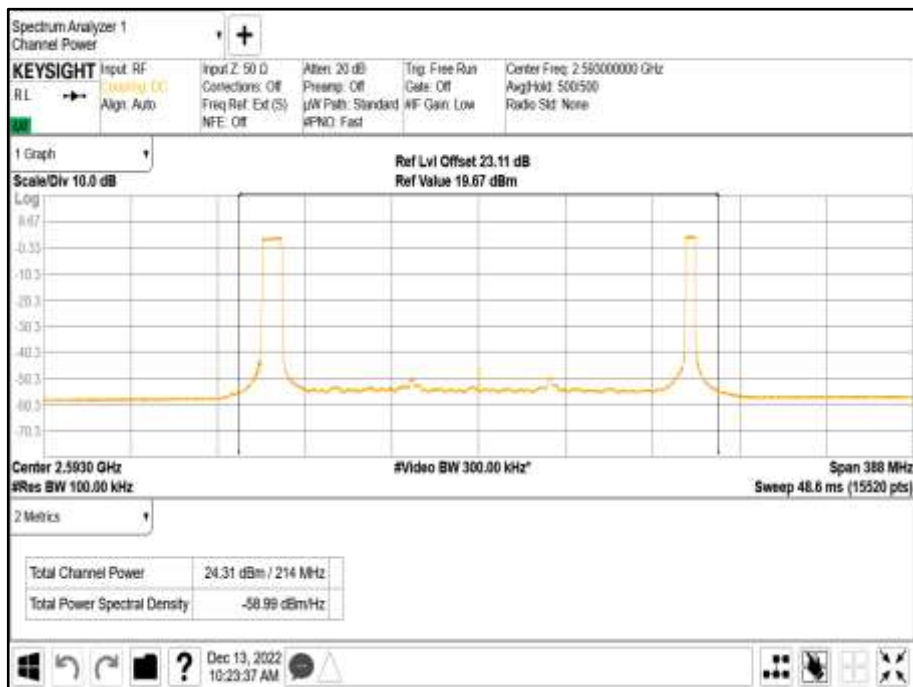




Antenna Port A Carrier Power - Modulation NR10+LTE5: QPSK - Carrier Bandwidth NR10+L5 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position B





Configuration C

Maximum Output Power 26.00 dBm / Port

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power		
			Channel Position B		
4.40	Antenna Port		Average Power (dBm)		
			dBm	EIRP (dBm)	
	4A	LTE: QPSK	5+5+5+5+5+5 MHz	24.29	28.69
	4B	LTE: QPSK	5+5+5+5+5+5 MHz	24.08	28.48
	Total			27.20	31.60
	4A	LTE: QPSK	20+20+20+20+20+20 MHz	24.65	29.05
	4B	LTE: QPSK	20+20+20+20+20+20 MHz	24.50	28.90
	Total			27.59	31.99
	4A	NR: QPSK	10+10+10+10+10+10 MHz	25.22	29.62
	4B	NR: QPSK	10+10+10+10+10+10 MHz	25.12	29.52
	Total			28.18	32.58
	4A	NR: QPSK	20+20+20+20+20+20 MHz	25.46	29.86
	4B	NR: QPSK	20+20+20+20+20+20 MHz	25.24	29.64
	Total			28.36	32.76
	4A	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.29	28.69
	4B	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.04	28.44
	Total			27.18	31.58
	4A	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.35	28.75
	4B	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.04	28.44
	Total			27.21	31.61

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power		
			Channel Position M		
4.40	Antenna Port		Average Power (dBm)		
			dBm	EIRP (dBm)	
	4A	LTE: QPSK	5+5+5+5+5+5 MHz	24.88	29.28
	4B	LTE: QPSK	5+5+5+5+5+5 MHz	24.63	29.03
	Total			27.77	32.17
	4A	LTE: QPSK	20+20+20+20+20+20 MHz	24.62	29.02
	4B	LTE: QPSK	20+20+20+20+20+20 MHz	24.57	28.97
	Total			27.61	32.01
	4A	NR: QPSK	10+10+10+10+10+10 MHz	25.54	29.94
	4B	NR: QPSK	10+10+10+10+10+10 MHz	25.35	29.75
	Total			28.46	32.86
	4A	NR: QPSK	20+20+20+20+20+20 MHz	25.64	30.04
	4B	NR: QPSK	20+20+20+20+20+20 MHz	25.40	29.80
	Total			28.53	32.93
	4A	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.47	28.87
	4B	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.35	28.75
	Total			27.42	31.82
	4A	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.35	28.75
	4B	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.04	28.44
	Total			27.21	31.61



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Output Power		
			Channel Position T		
4.40	Antenna Port		Average Power (dBm)		
			dBm	EIRP (dBm)	
	4A	LTE: QPSK	5+5+5+5+5+5 MHz	25.02	29.42
	4B	LTE: QPSK	5+5+5+5+5+5 MHz	25.05	29.45
	Total			28.05	32.45
	4A	LTE: QPSK	20+20+20+20+20+20 MHz	24.90	29.30
	4B	LTE: QPSK	20+20+20+20+20+20 MHz	24.72	29.12
	Total			27.82	32.22
	4A	NR: QPSK	10+10+10+10+10+10 MHz	25.80	30.20
	4B	NR: QPSK	10+10+10+10+10+10 MHz	25.60	30.00
	Total			28.71	33.11
	4A	NR: QPSK	20+20+20+20+20+20 MHz	25.74	30.14
	4B	NR: QPSK	20+20+20+20+20+20 MHz	25.48	29.88
	Total			28.62	33.02
	4A	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.81	29.21
	4B	NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.58	28.98
	Total			27.71	32.11
	4A	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.35	28.75
	4B	* NR10+LTE5: QPSK	10+10+10+5+5+5 MHz	24.04	28.44
	Total			27.21	31.61

Remarks

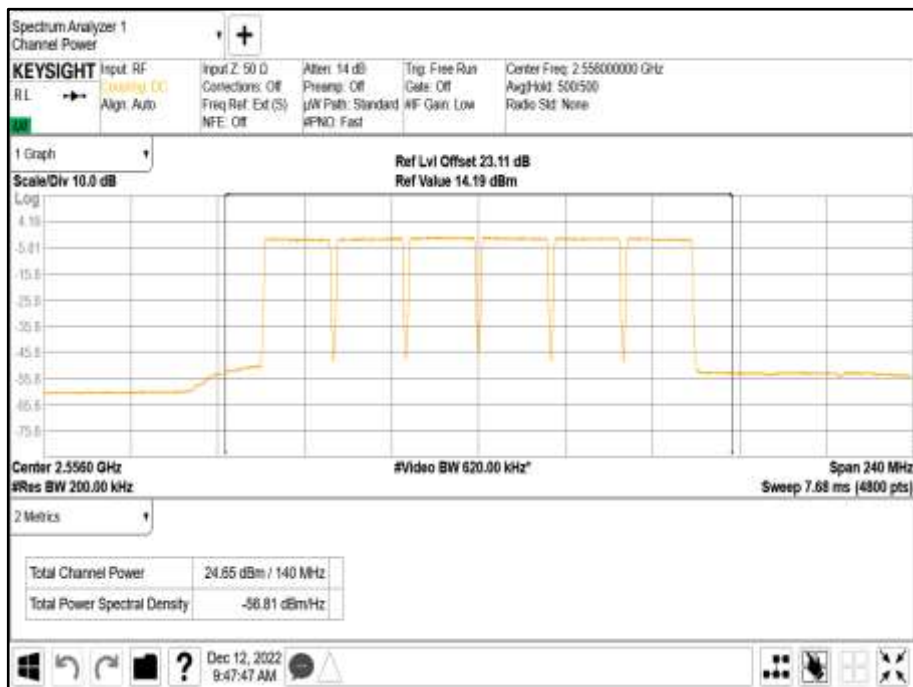
1. The table results are measured at all antenna ports, worst-case performance presented.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels are available on request.
- 4 * indicates a Non-Contiguous (NC) configuration.



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 20+20+20+20+20+20 MHz - Channel Position B

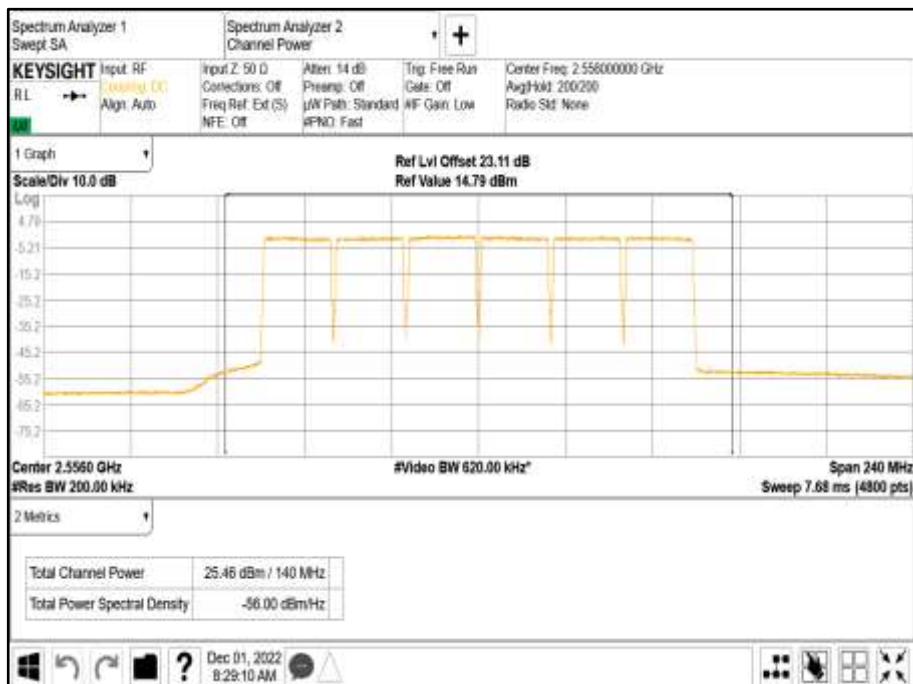




Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth
10+10+10+10+10+10 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth
20+20+20+20+20+20 MHz - Channel Position B

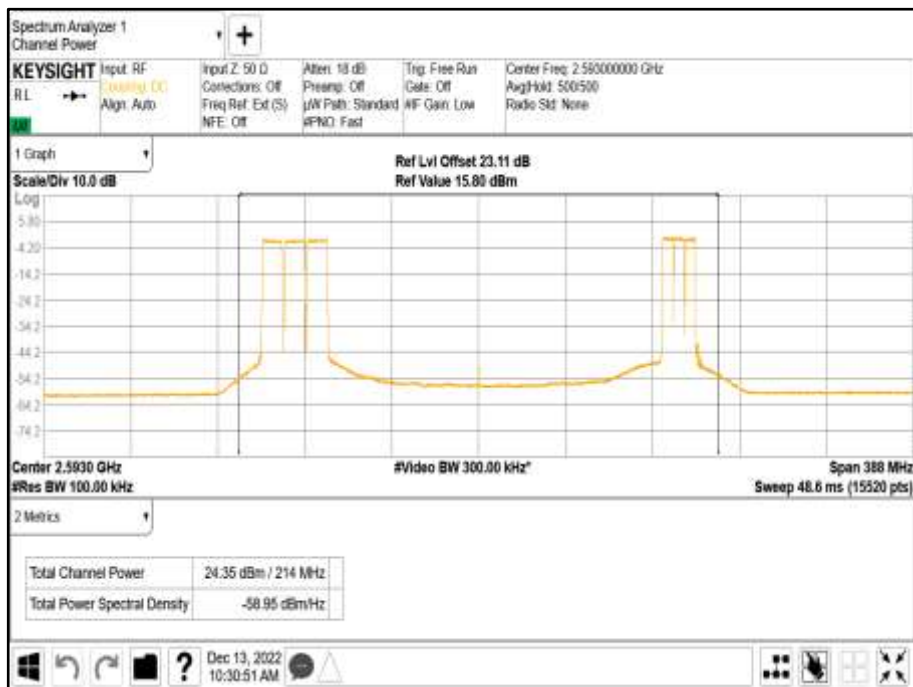




Antenna Port A Carrier Power - Modulation NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position B



Antenna Port A Carrier Power - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position B





Limit	
Maximum rated output power (Non-Rural)	$\leq 1640 \text{ W/MHz}$ or $\leq +62.15 \text{ dBm/MHz}$
Maximum rated output power (Rural)	$\leq 3280 \text{ W/MHz}$ or $\leq +65.15 \text{ dBm/MHz}$
Peak to Average Ratio	13 dB



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53
 FCC CFR 47 Part 2, Clause 2.1049

2.2.2 Date of Test and Modification State

01-December-2022 - Modification State 0

2.2.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.4 Environmental Conditions

Ambient Temperature 25.0°C
 Relative Humidity 31.7%

2.2.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 4.2 and 4.3. The Spectrum Analyser RBW was configured to be at least 1% of the channel bandwidth of the carrier to be measured.

Occupied bandwidth – power bandwidth (99 %) measurement procedure
 Subclause 5.4.4 of ANSI C63.26-2015 is applicable (wherein the recommendation is to use the 99 % power bandwidth function of a spectrum analyser).

2.2.6 Test Results

Configuration A

Maximum Output Power 24.00 dBm / Port

Modulation	Carrier Bandwidth	Result (MHz)
		99% Occupied Bandwidth
LTE: QPSK	LTE: 5.0 MHz	4.485
LTE: QPSK	LTE: 10.0 MHz	8.969
LTE: QPSK	LTE: 15.0 MHz	13.458
LTE: QPSK	LTE: 20.0 MHz	17.887
NR: QPSK	NR:10.0 MHz	8.613
NR: QPSK	NR: 20.0 MHz	18.266
NR: QPSK	NR: 30.0 MHz	27.906
NR: QPSK	NR: 40.0 MHz	37.913
NR: QPSK	NR: 50.0 MHz	47.494
NR: QPSK	NR: 60.0 MHz	57.880
NR: QPSK	NR: 70.0 MHz	67.362
NR: QPSK	NR: 80.0 MHz	77.369
NR: QPSK	NR: 90.0 MHz	87.416
NR: QPSK	NR: 100.0 MHz	97.336



Remarks

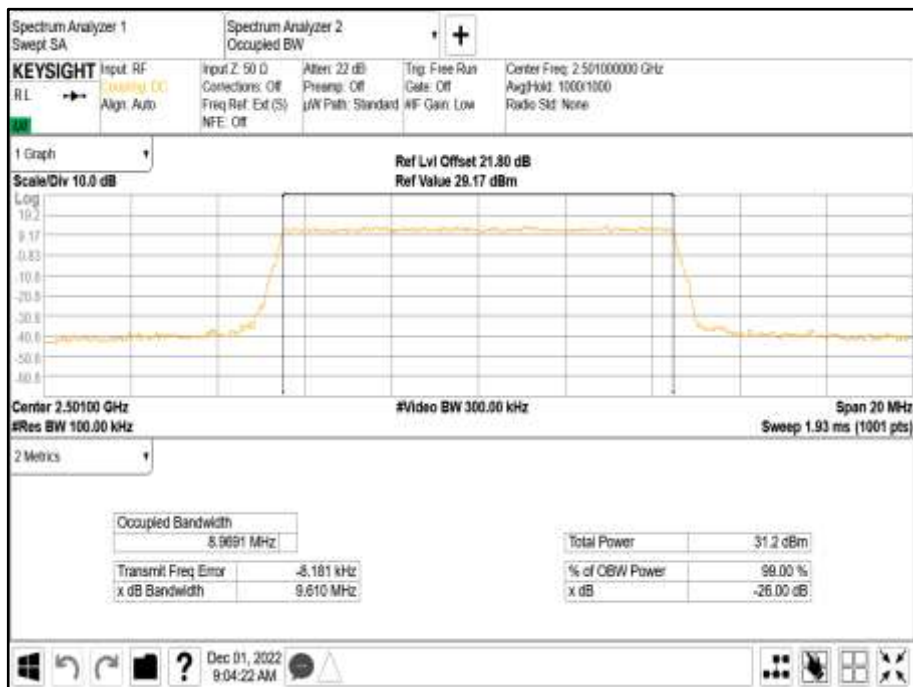
Representative occupied bandwidth performance results presented. Plot data performance for all transmitter ports and channel positions are on file and available on request.



Antenna A - Modulation LTE: QPSK - LTE Carrier Bandwidth LTE: 5.0 MHz - Channel Position B



Antenna A - Modulation LTE: QPSK - LTE Carrier Bandwidth LTE: 10.0 MHz - Channel Position B

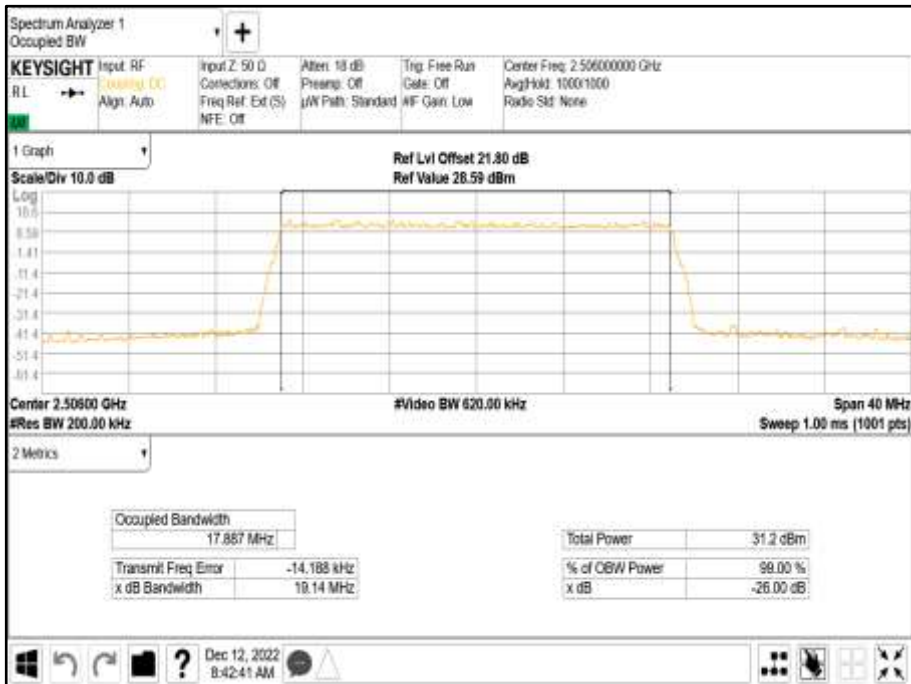




Antenna A - Modulation LTE: QPSK - LTE Carrier Bandwidth LTE: 15.0 MHz - Channel Position B

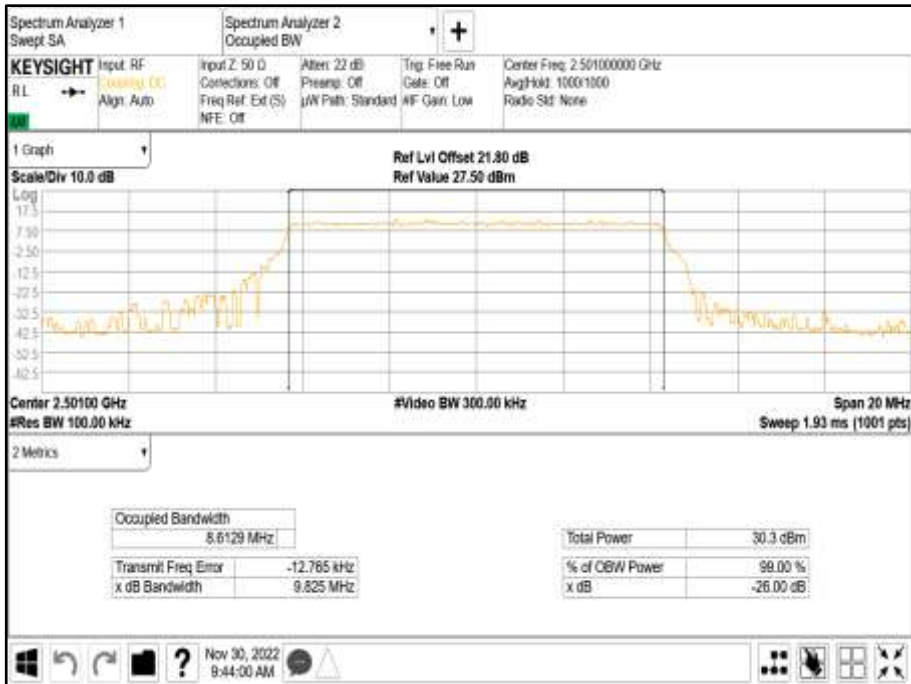


Antenna A - Modulation LTE: QPSK - LTE Carrier Bandwidth LTE: 20.0 MHz - Channel Position B

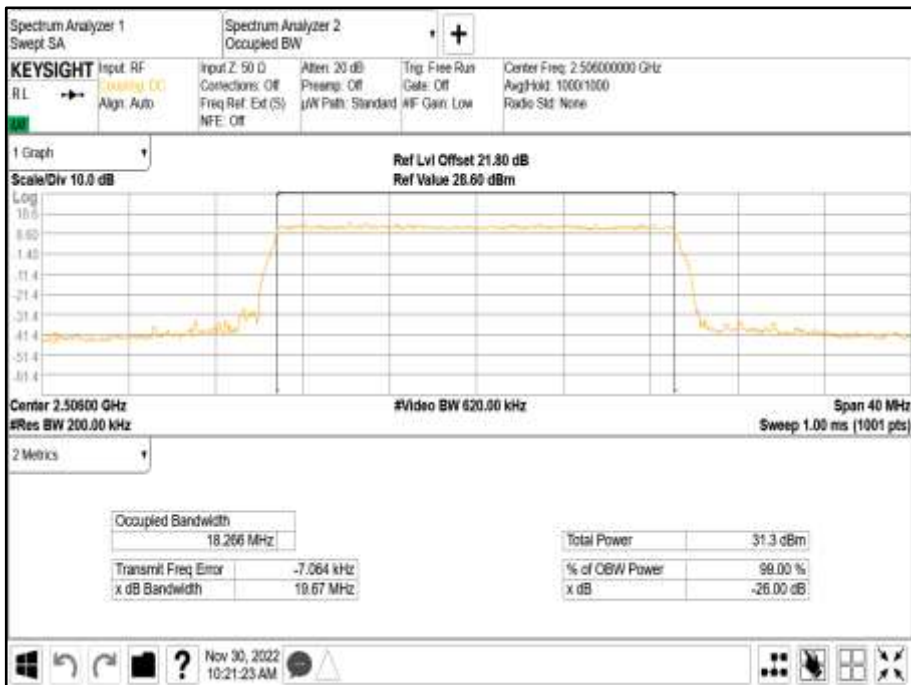




Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 10.0 MHz - Channel Position B

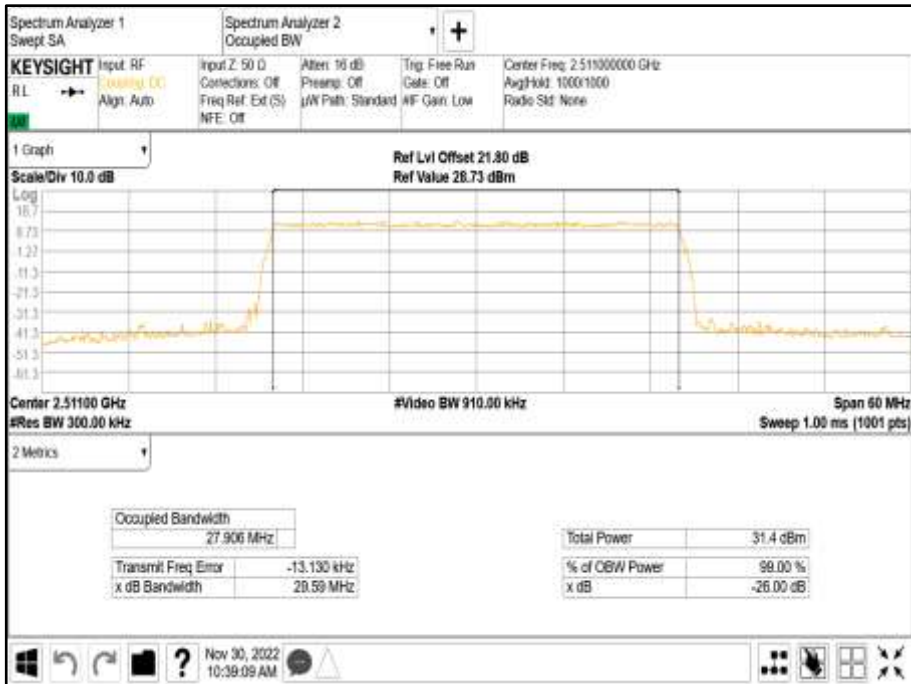


Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 20.0 MHz - Channel Position B

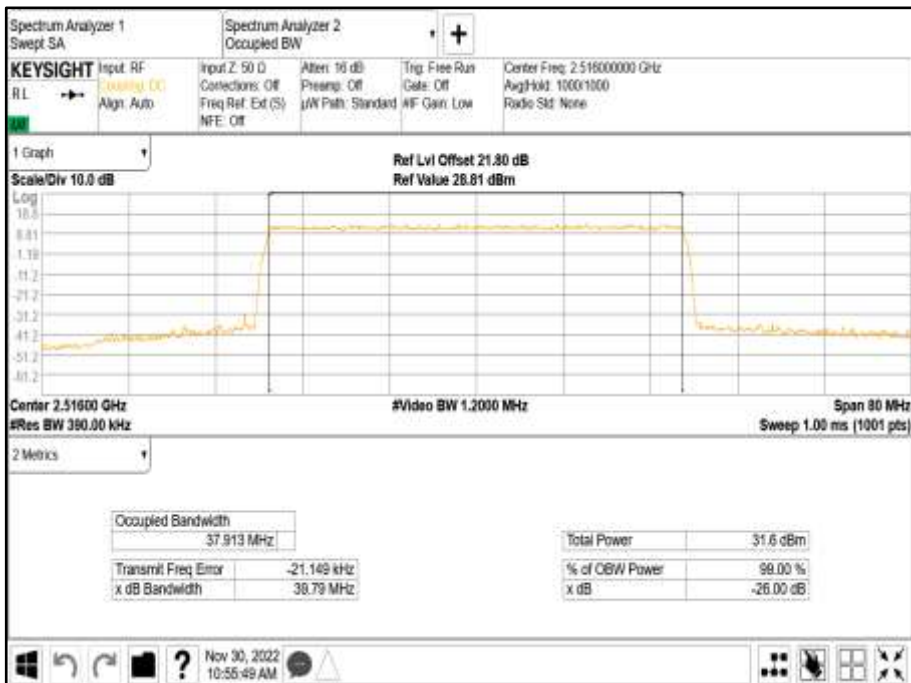




Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 30.0 MHz - Channel Position B

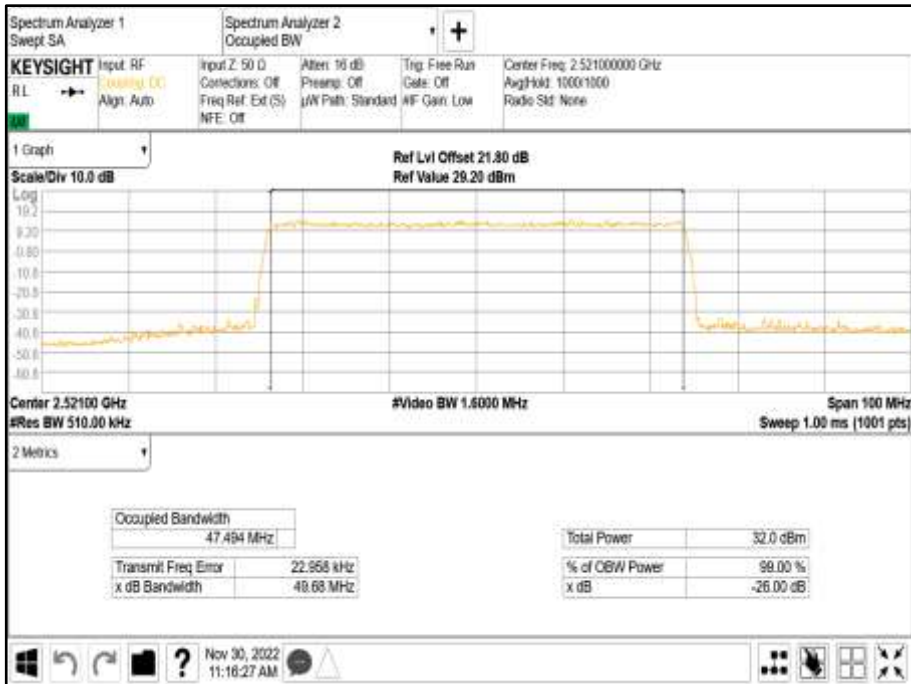


Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 40.0 MHz - Channel Position B

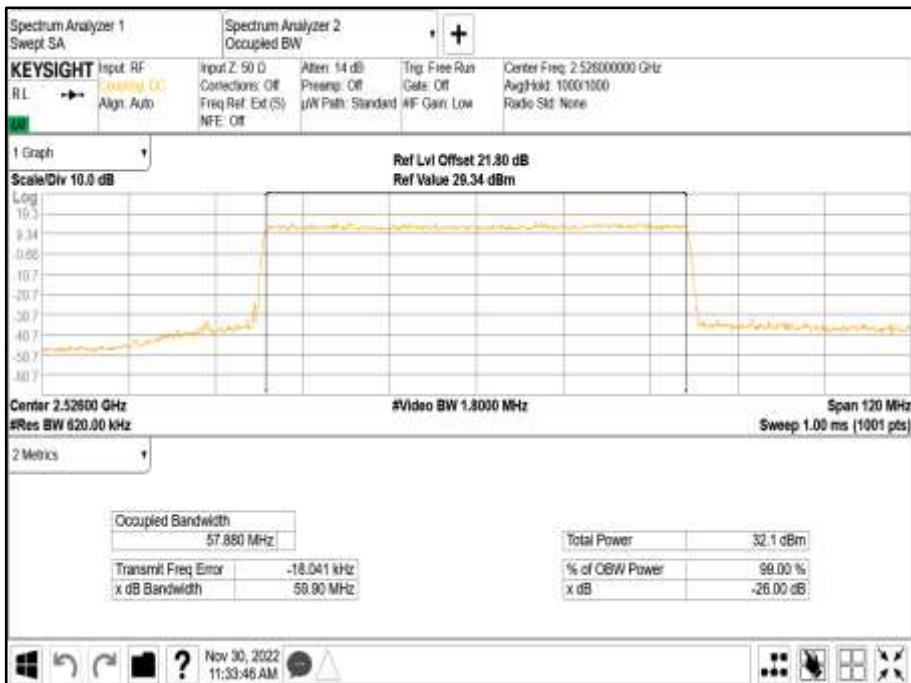




Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 50.0 MHz - Channel Position B

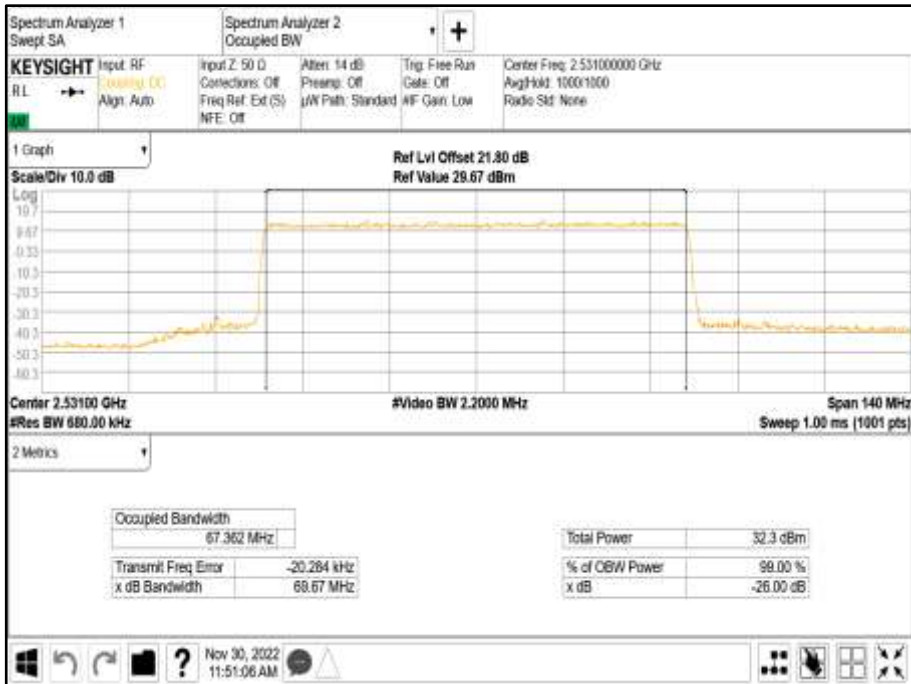


Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 60.0 MHz - Channel Position B

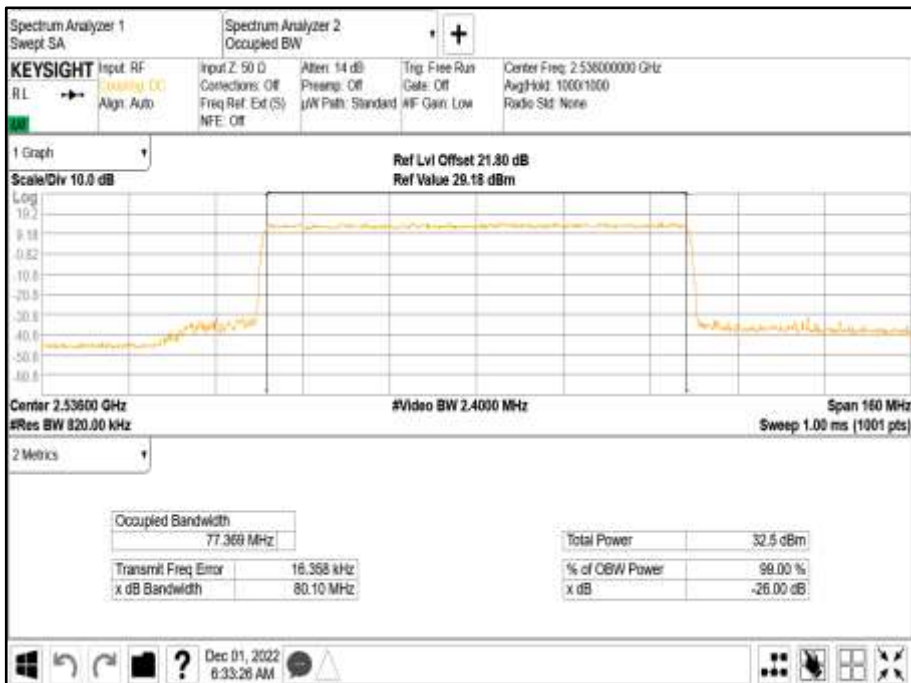




Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 70.0 MHz - Channel Position B

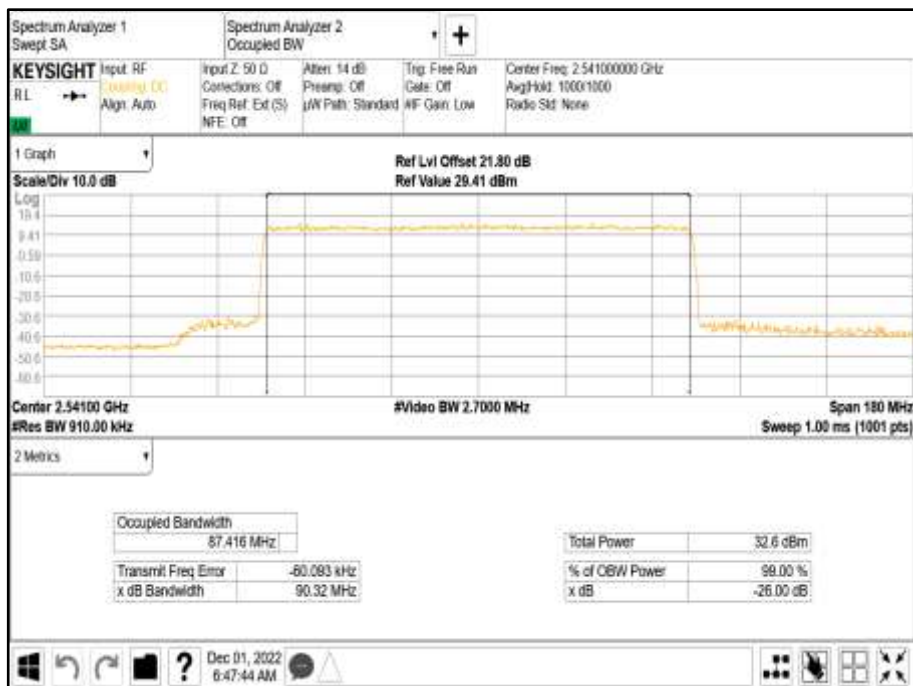


Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 80.0 MHz - Channel Position B

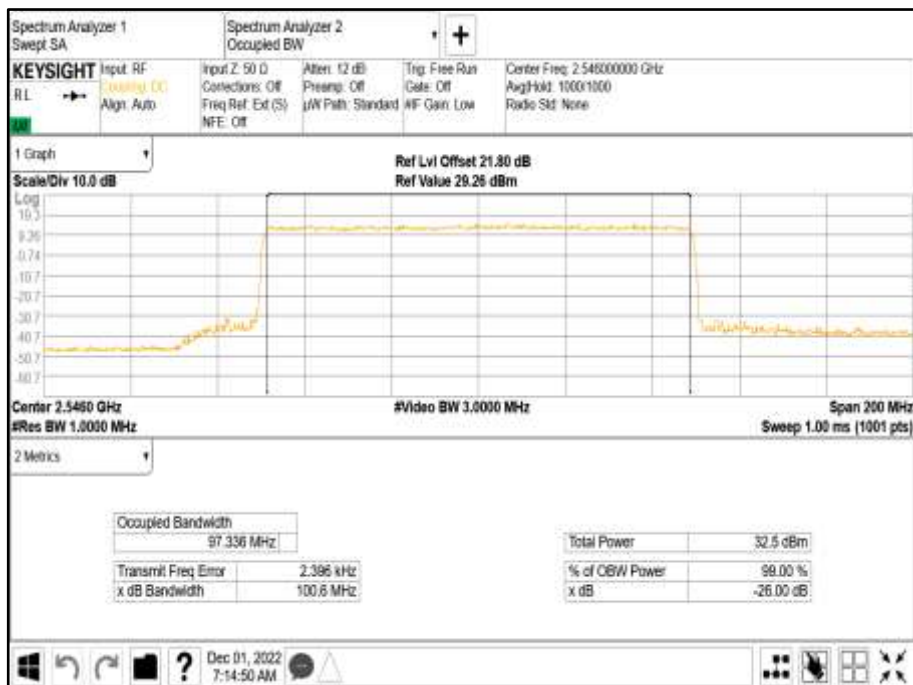




Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 90.0 MHz - Channel Position B



Antenna A - Modulation NR: QPSK - LTE Carrier Bandwidth NR: 100.0 MHz - Channel Position B





2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53
FCC CFR 47 Part 2, Clause 2.1051

2.3.2 Date of Test and Modification State

01 and 12-December-2022 - Modification State 0

2.3.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.3.4 Environmental Conditions

Ambient Temperature	24.7 - 25.0°C
Relative Humidity	31.7 - 33.1%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.0.

Band Edge measurements were used an Integration Bandwidth of at least 1% of the measured 26dB Bandwidth.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \text{Log}(N)$, where N is equal to the number of MIMO antenna ports.

For dual port, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(2) = -16 \text{ dBm}$.

2.3.6 Test Results



Configuration A

Maximum Output Power 24.00 dBm / Port

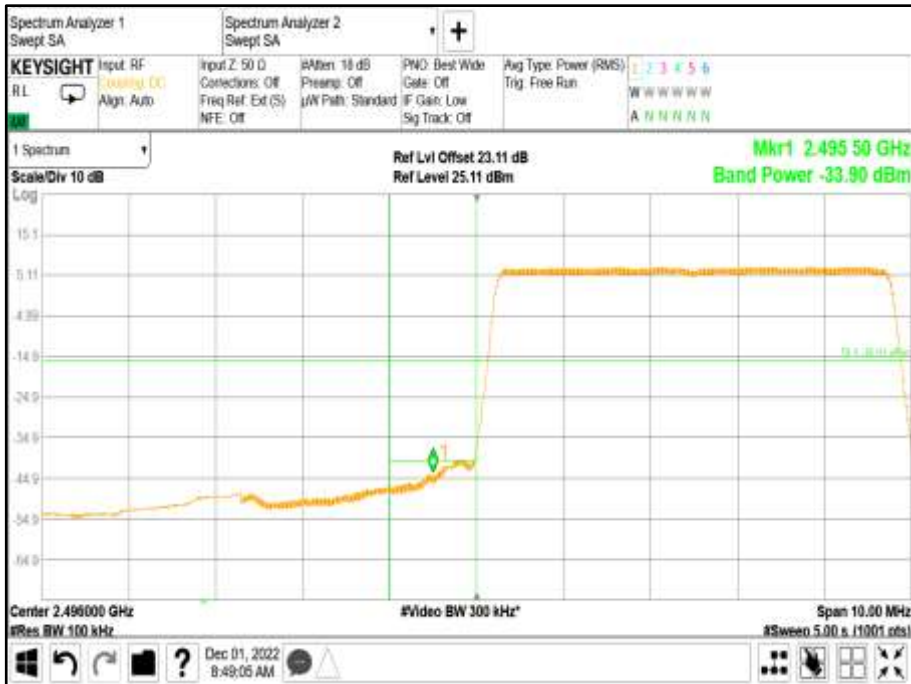
Modulation	Carrier Bandwidth	Band Edge (MHz)	
		Channel Position B	Channel Position T
LTE: QPSK	LTE: 5.0 MHz	2,498.5	2,687.5
LTE: QPSK	LTE: 10.0 MHz	2,501.0	2,685.0
LTE: QPSK	LTE: 15.0 MHz	2,503.5	2,682.5
LTE: QPSK	LTE: 20.0 MHz	2,506.0	2,680.0
NR: QPSK	NR: 10.0 MHz	2,501.0	2,685.0
NR: QPSK	NR: 20.0 MHz	2,506.0	2,680.0
NR: QPSK	NR: 30.0 MHz	2,511.0	2,675.0
NR: QPSK	NR: 40.0 MHz	2,516.0	2,670.0
NR: QPSK	NR: 50.0 MHz	2,521.0	2,665.0
NR: QPSK	NR: 60.0 MHz	2,526.0	2,660.0
NR: QPSK	NR: 70.0 MHz	2,531.0	2,655.0
NR: QPSK	NR: 80.0 MHz	2,538.0	2,650.0
NR: QPSK	NR: 90.0 MHz	2,541.0	2,645.0
NR: QPSK	NR: 100.0 MHz	2,546.0	2,640.0

Remarks

1. Bandedge data was captured from the transmit port with maximum measured power.
2. Worst case bandedge data presented.



Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position B

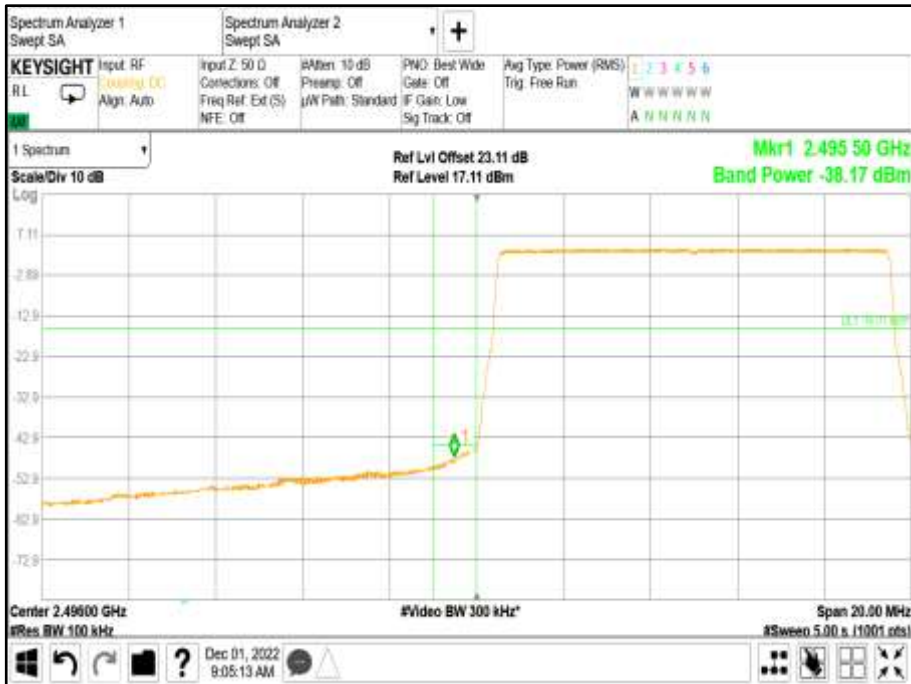


Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position T

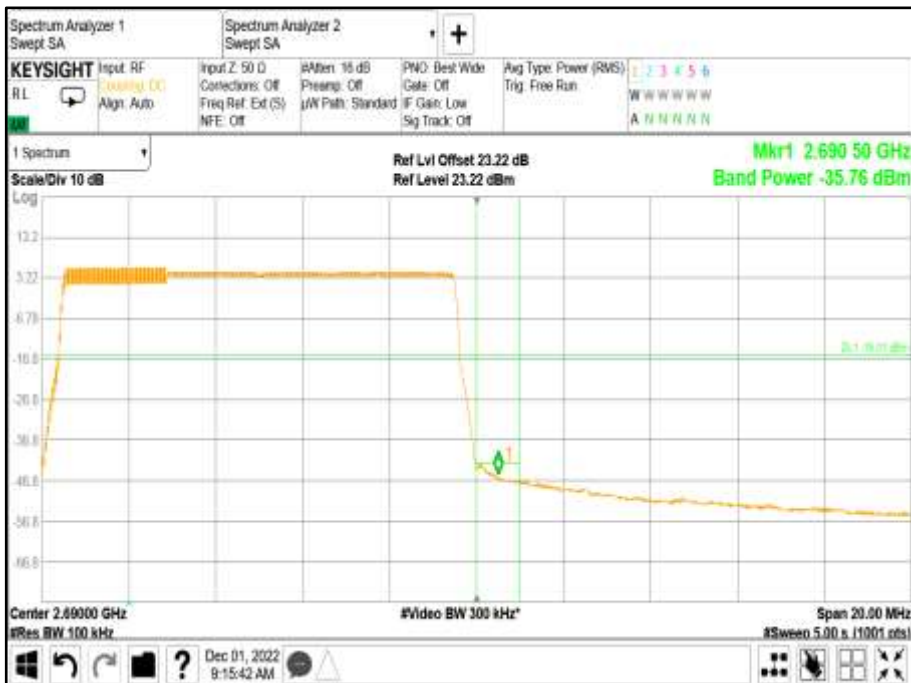




Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position B

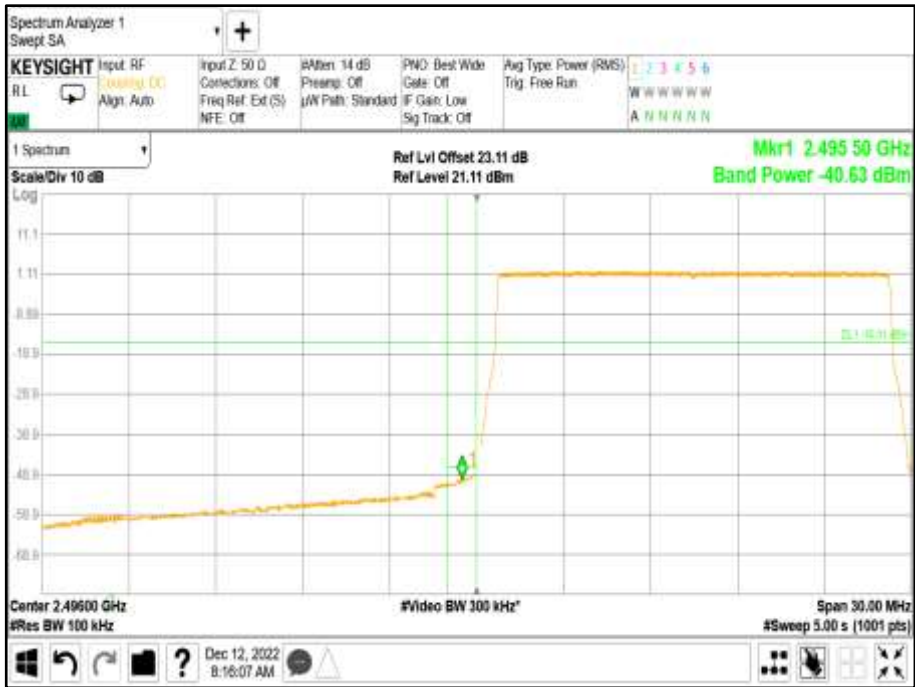


Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position T





Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 15.0 MHz - Channel Position B



Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 15.0 MHz - Channel Position T





Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position B

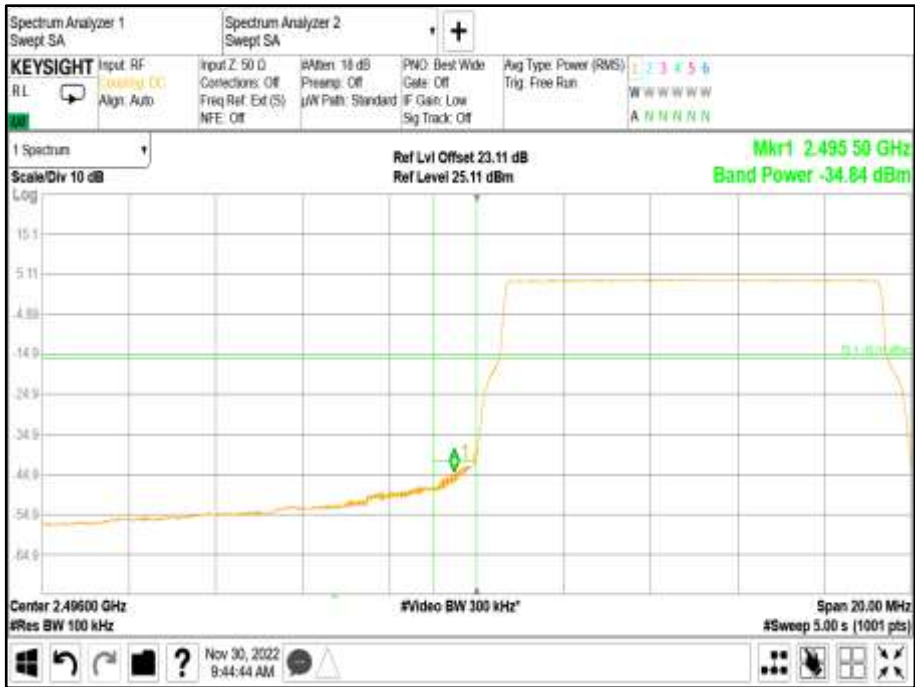


Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position T

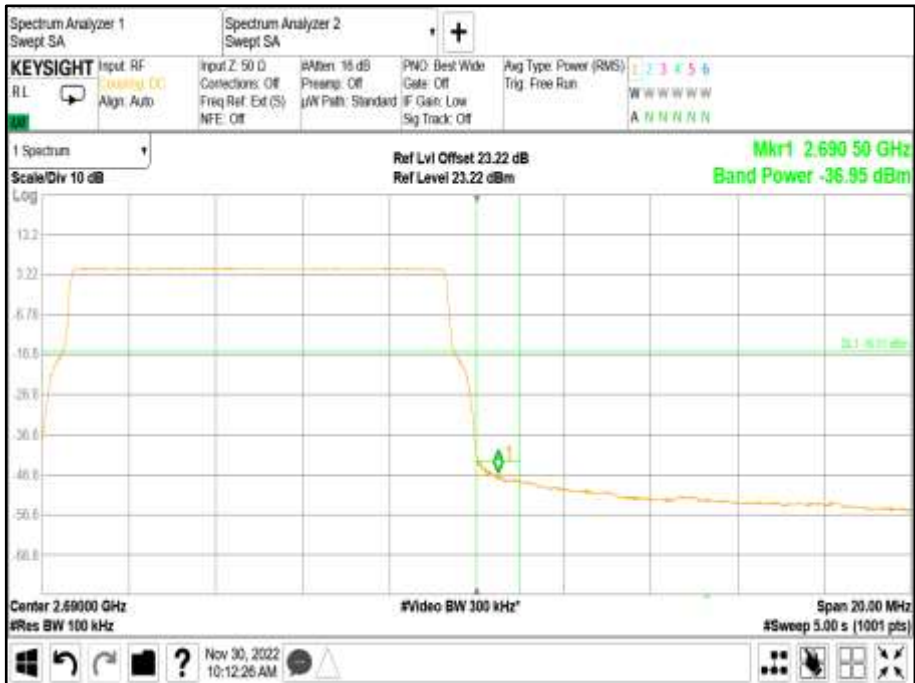




Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 10.0 MHz - Channel Position B

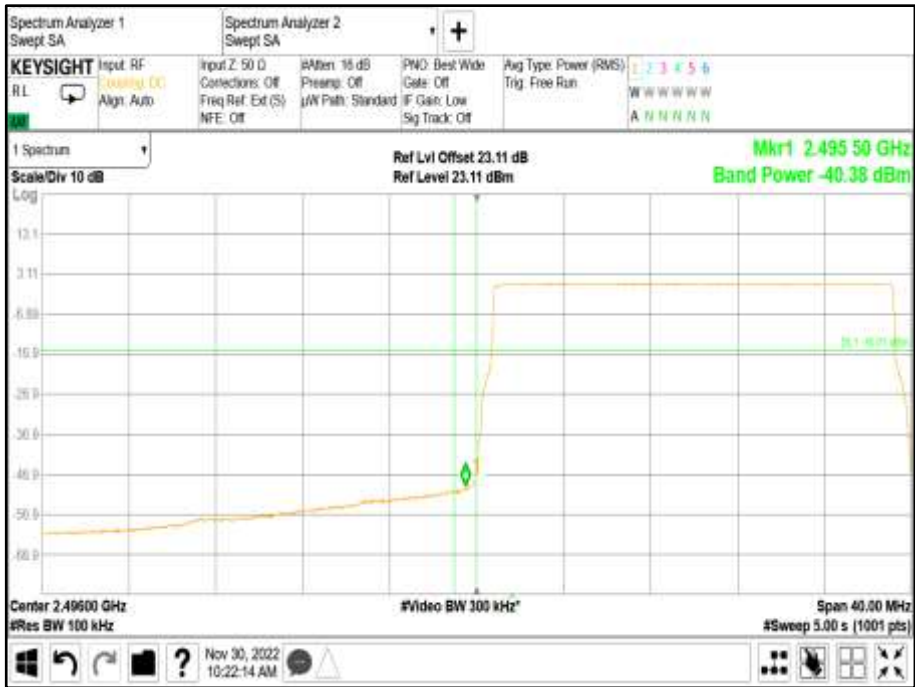


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 10.0 MHz - Channel Position T

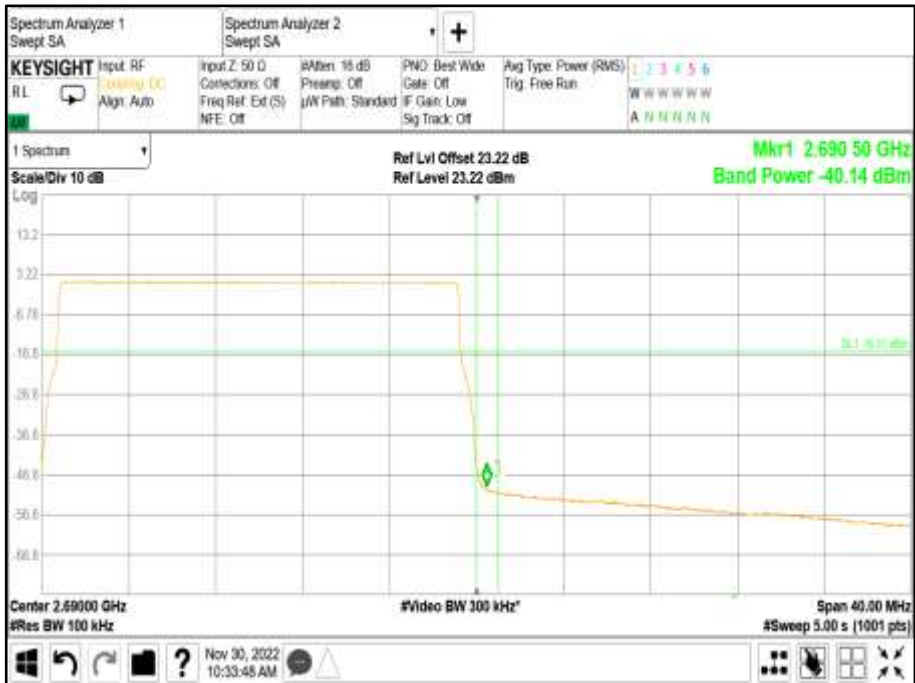




Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 20.0 MHz - Channel Position B

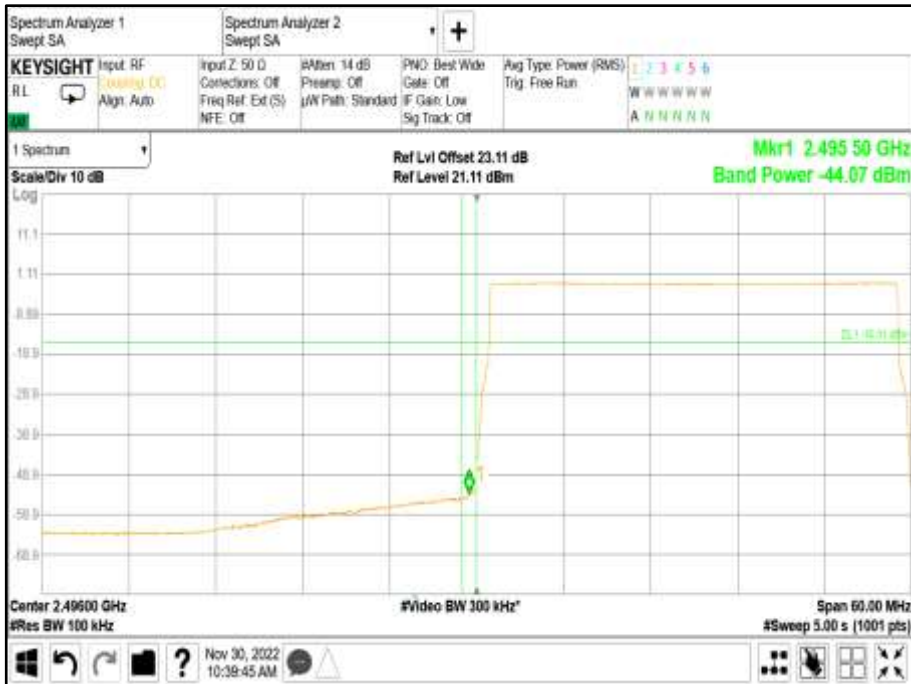


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 20.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 30.0 MHz - Channel Position B

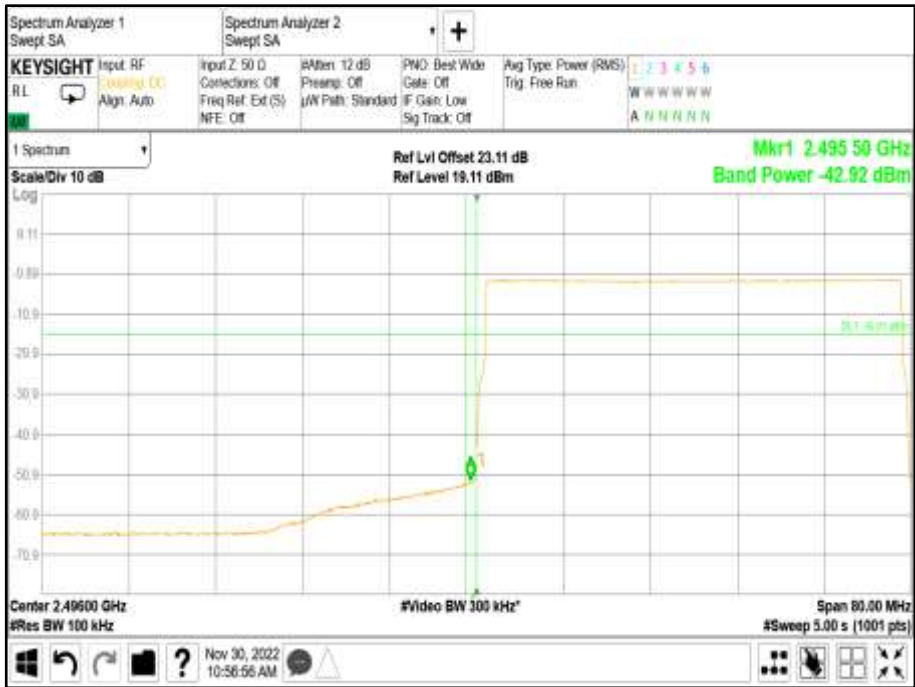


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 30.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 40.0 MHz - Channel Position B

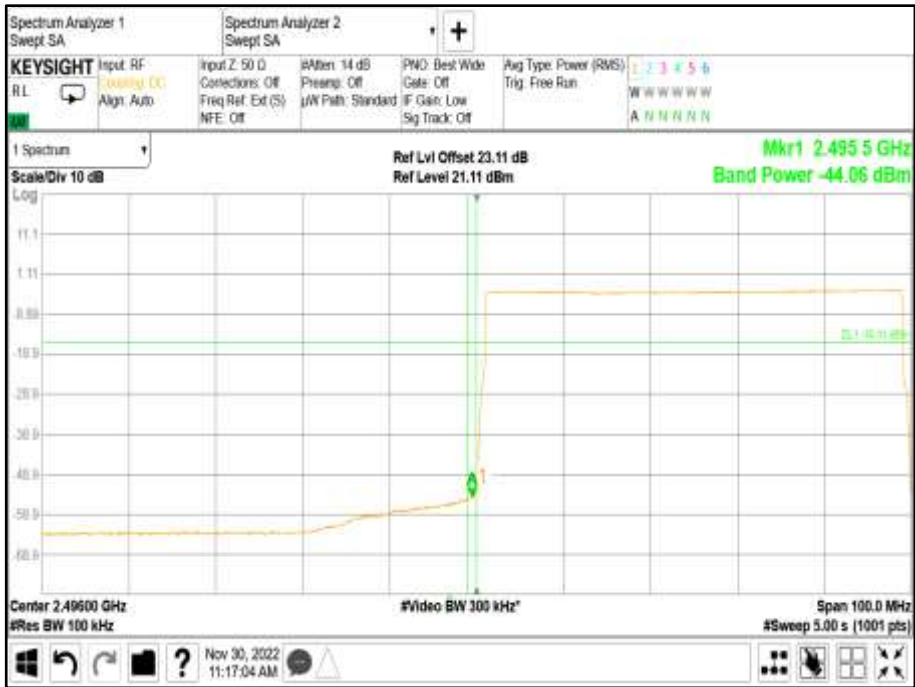


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 40.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position B

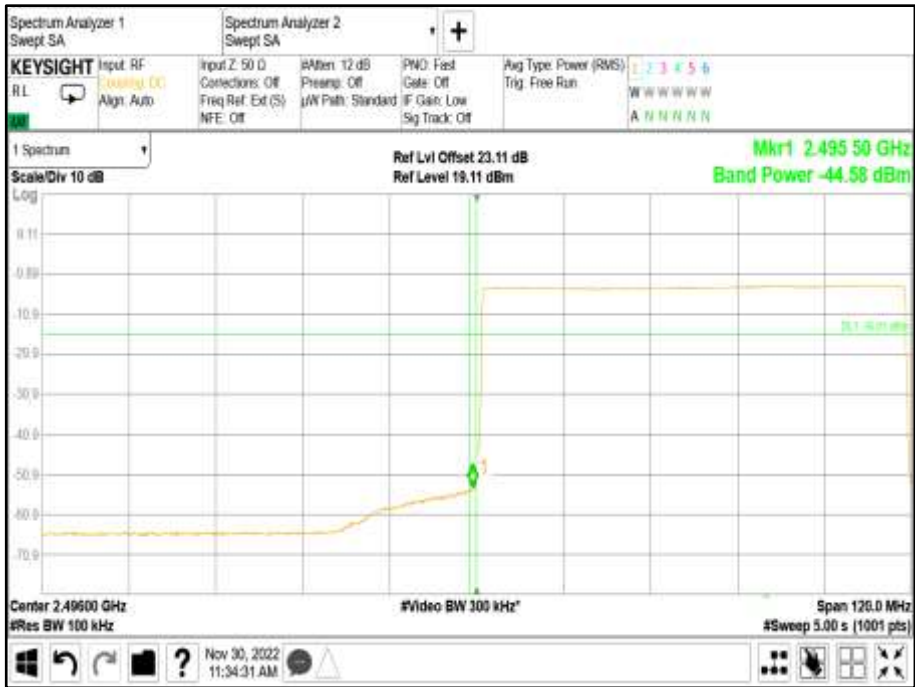


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 60.0 MHz - Channel Position B

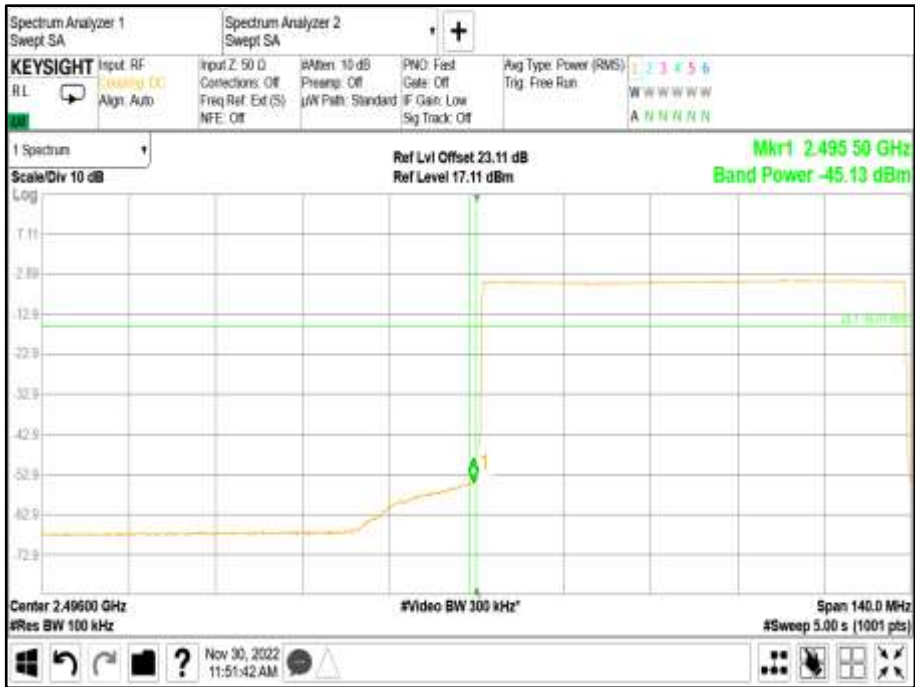


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 60.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 70.0 MHz - Channel Position B

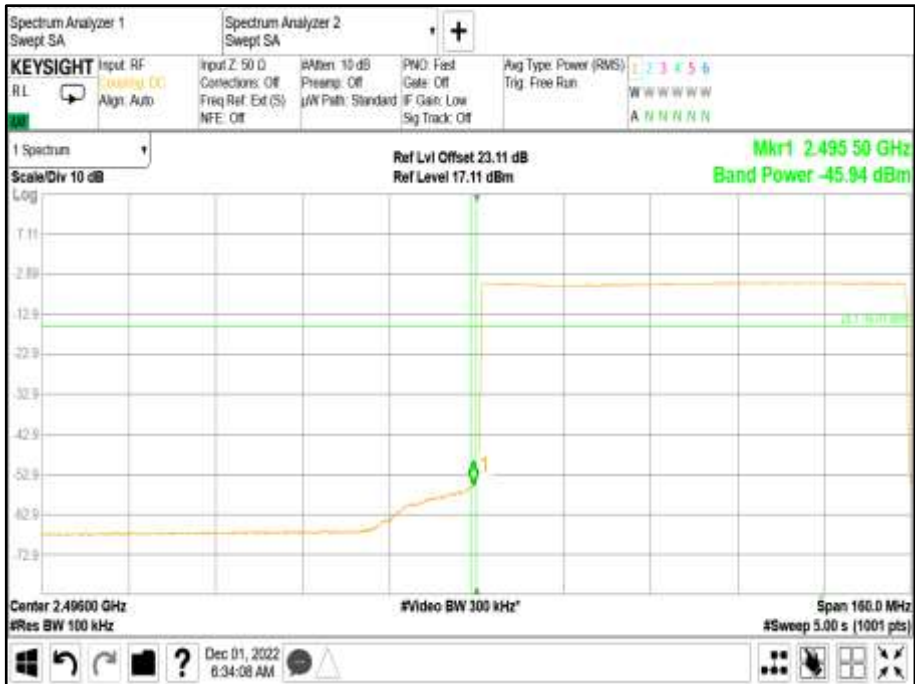


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 70.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 80.0 MHz - Channel Position B



Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 80.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 90.0 MHz - Channel Position B

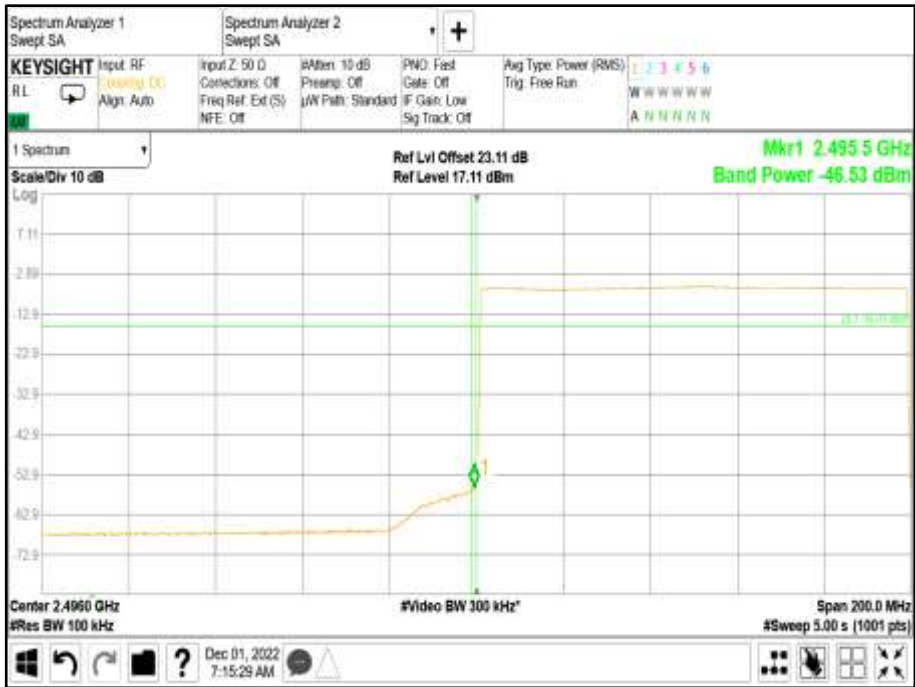


Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 90.0 MHz - Channel Position T





Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 100.0 MHz - Channel Position B



Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 100.0 MHz - Channel Position T





Configuration B

Maximum Output Power 26.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
4A	LTE5: QPSK	L5.0+L5.0 MHz	2517.5+2530.0	2652.5+2665.0
4B	LTE20: QPSK	L20.0+L20.0 MHz	2517.5+2530.0	2652.5+2665.0
4A	NR10: QPSK	NR10+NR10 MHz	2501 + 2511	2675 + 2685
4B	NR90: QPSK	NR90+NR90 MHz	2541 + 2631	2555 + 2645
4A	NR10+LTE5: QPSK	NR10+L5 MHz	2501 + 2508.5	2680 + 2687.5
4B	* NR10+LTE5: QPSK	* NR10+L5 MHz	2501 + 2687.5	2501 + 2687.5

Remarks

1. The plots results represent typical radio performance.
2. * indicates a Non-Contiguous (NC) configuration.



Antenna Port A A - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position B



Antenna Port A A - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position T





Antenna Port A A - Modulation LTE20: QPSK - Carrier Bandwidth L20.0+L20.0 MHz - Channel Position B

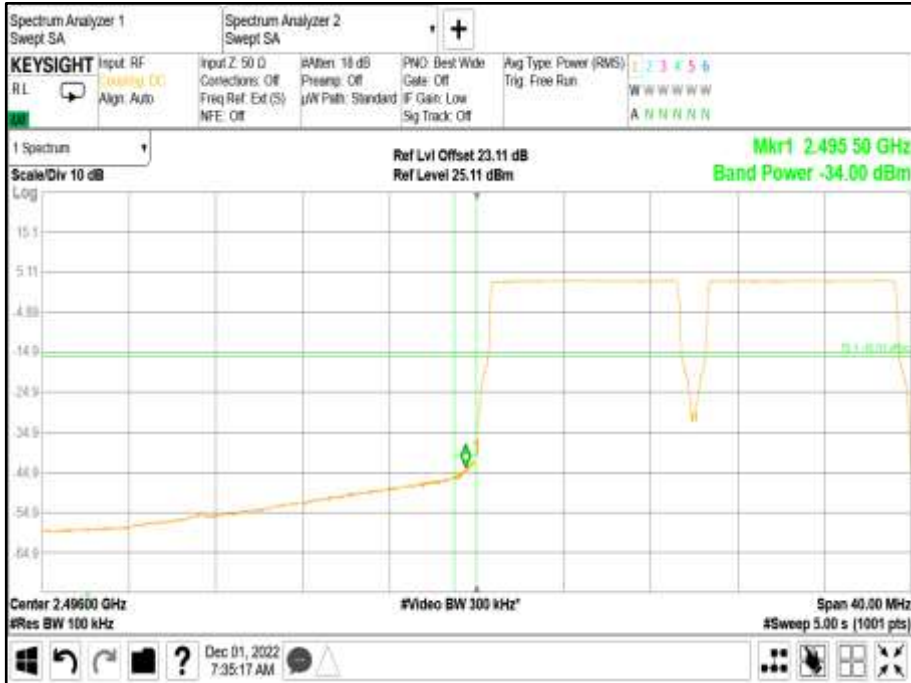


Antenna Port A A - Modulation LTE20: QPSK - Carrier Bandwidth L20.0+L20.0 MHz - Channel Position T

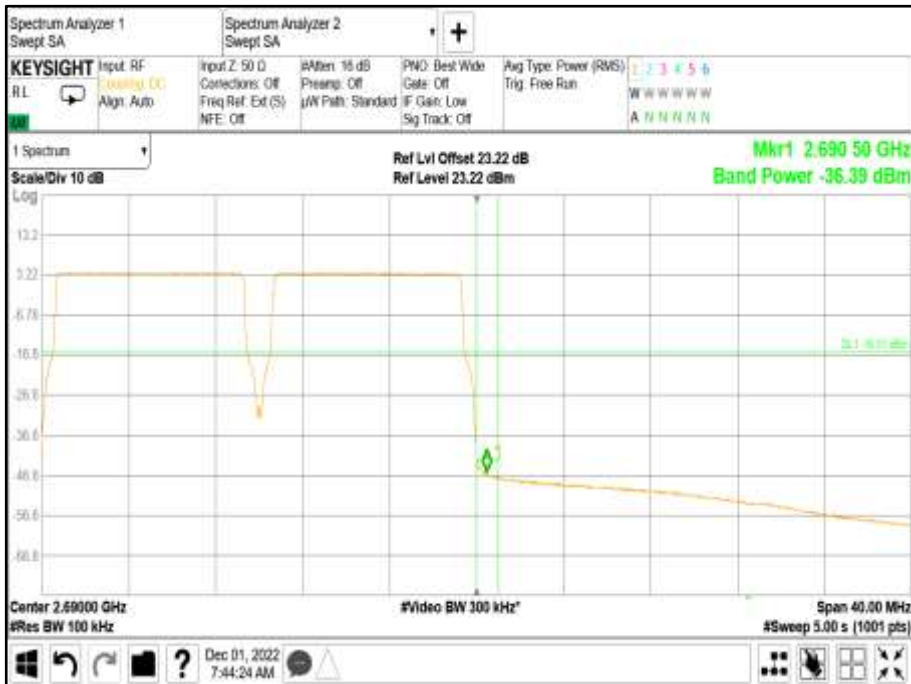




Antenna Port A A - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position B



Antenna Port A A - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position T

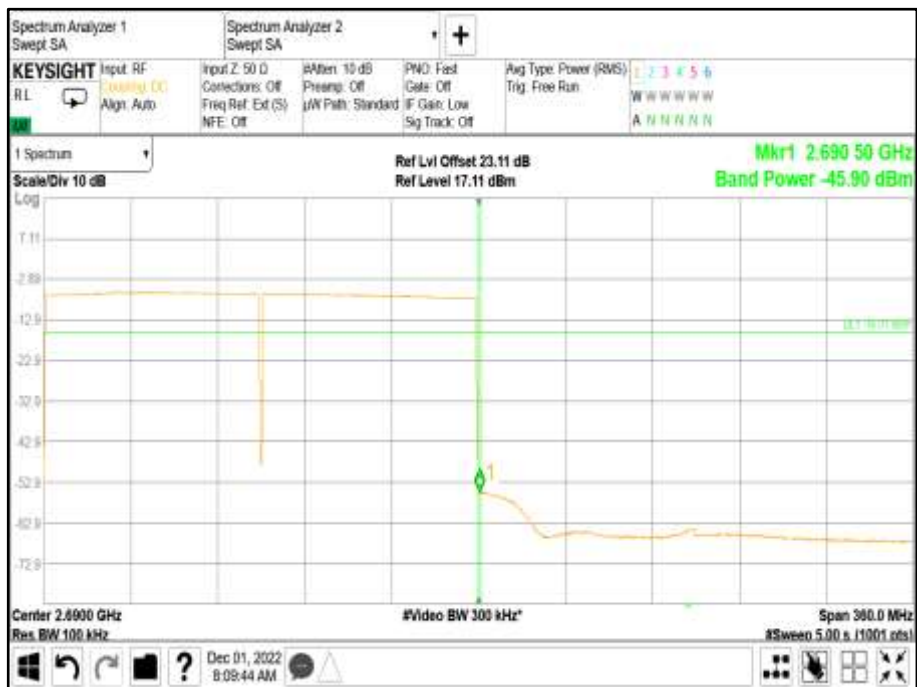




Antenna Port A A - Modulation NR90: QPSK - Carrier Bandwidth NR90+NR90 MHz - Channel Position B



Antenna Port A A - Modulation NR90: QPSK - Carrier Bandwidth NR90+NR90 MHz - Channel Position T





Antenna Port A A - Modulation NR10+LTE5: QPSK - Carrier Bandwidth NR10+L5 MHz - Channel Position B

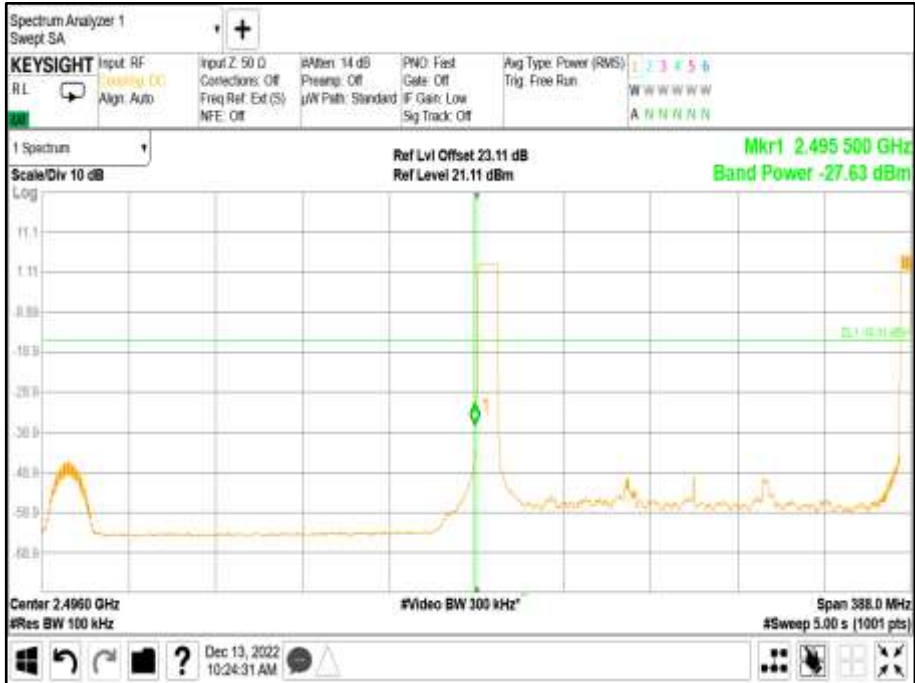


Antenna Port A A - Modulation NR10+LTE5: QPSK - Carrier Bandwidth NR10+L5 MHz - Channel Position T

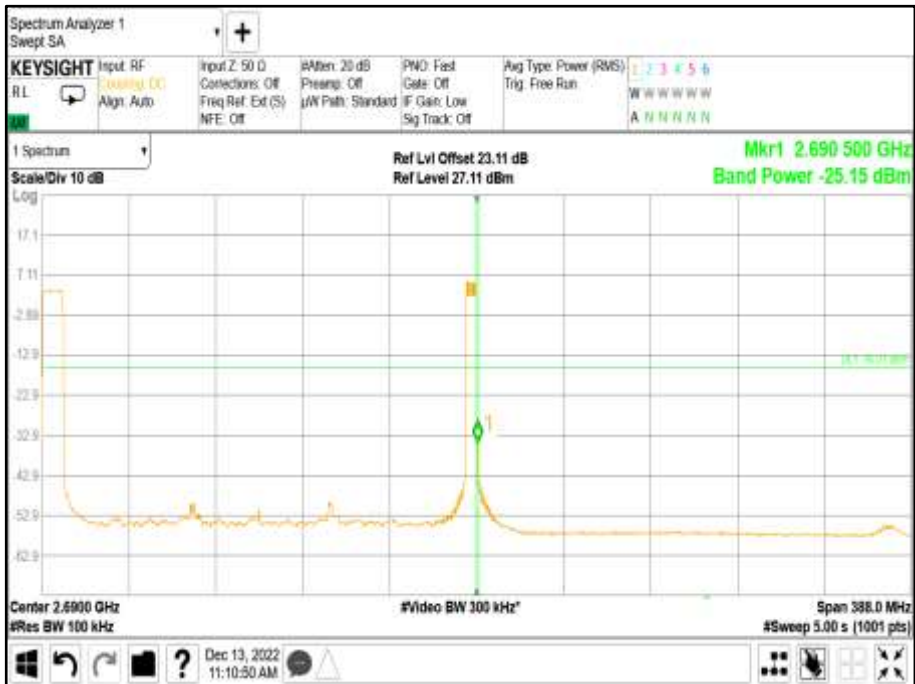




Antenna Port A A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position B



Antenna Port A A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position T





Configuration C

Maximum Output Power 26.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	LTE: QPSK	5+5+5+5+5+5 MHz	2498.5+2503.5+2508.5+2513.5+2518.5+2523.5	2662.5+2667.5+2672.5+2677.5+2682.5+2687.5
A	LTE: QPSK	20+20+20+20+20+20 MHz	2606+2526+2546+2566+2586+2606	2580+2600+2620+2640+2660+2680
A	NR: QPSK	10+10+10+10+10+10 MHz	2501+2511+2521+2531+2541+2551	2635+2645+2655+2665+2675+2685
A	NR: QPSK	20+20+20+20+20+20 MHz	2606+2526+2546+2566+2586+2606	2580+2600+2620+2640+2660+2680
A	NR10+LTE 5: QPSK	10+10+10+5+5+5 MHz	2501+2511+2521+2528.5+2533.5+2538.5	2650+2660+2670+2677.5+2682.5+2687.5
A	* NR10+LTE 5: QPSK	10+10+10+5+5+5 MHz	2501+2511+2521+2677.5+2682.3+2687.5	2501+2511+2521+2677.5+2682.3+2687.5

Remarks

1. The plots results represent typical radio performance.
2. * indicates a Non-Contiguous (NC) configuration.



Antenna Port A Plots - Modulation LTE: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position B



Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position T





Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 20+20+20+20+20+20 MHz - Channel Position B



Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 20+20+20+20+20+20 MHz - Channel Position T





Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B



Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position T





Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 20+20+20+20+20+20 MHz - Channel Position B



Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 20+20+20+20+20+20 MHz - Channel Position T





Antenna Port A A - Modulation NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position B

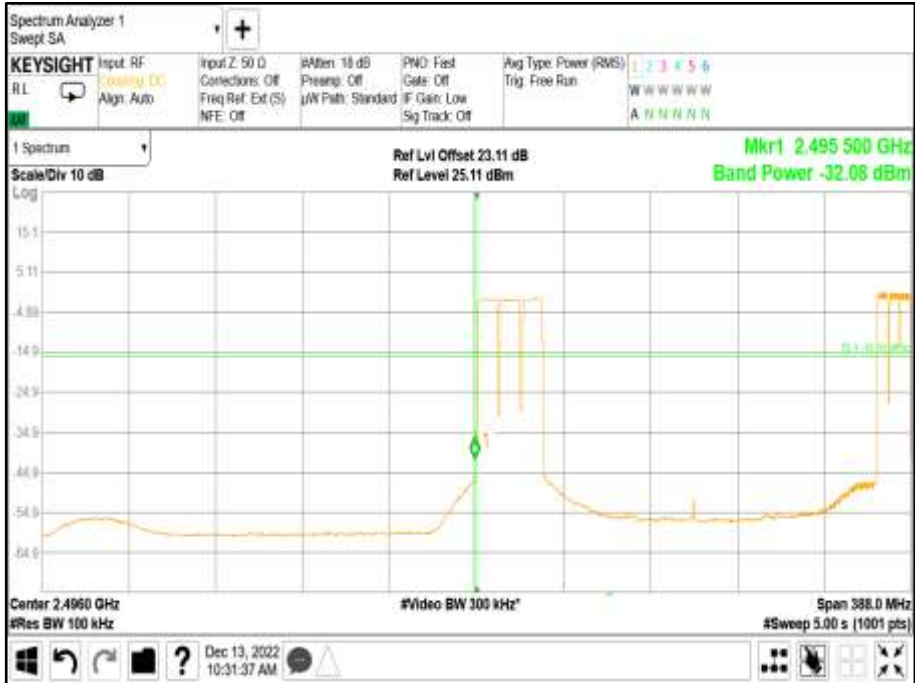


Antenna Port A A - Modulation NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position T

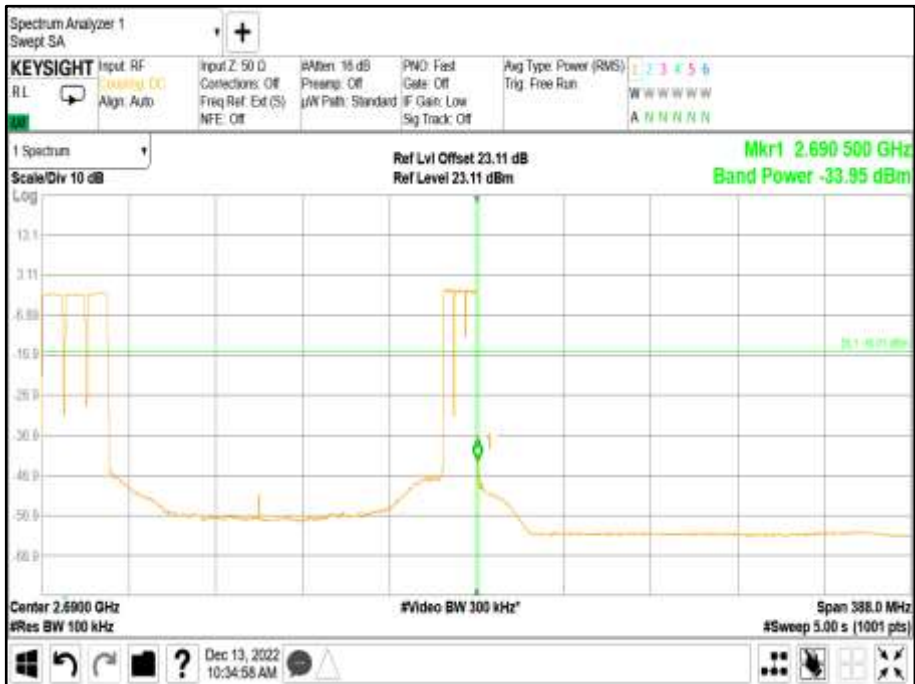




Antenna Port A A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position B



Antenna Port A A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth 10+10+10+5+5+5 MHz - Channel Position T



Limit	-16 dBm
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2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53
FCC CFR 47 Part 2, Clause 2.1051

2.4.2 Date of Test and Modification State

01 and 12-December-2022 - Modification State 0

2.4.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.4.4 Environmental Conditions

Ambient Temperature	24.7 - 25.0°C
Relative Humidity	31.7 - 33.1%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 6.1.

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by $10 * \text{Log}(N)$, where N is equal to the number of MIMO antenna ports.

For dual port, the limit was calculated as being $-13 \text{ dBm} - 10 * \text{Log}(2) = -16 \text{ dBm}$.

2.4.6 Test Results

Configuration A

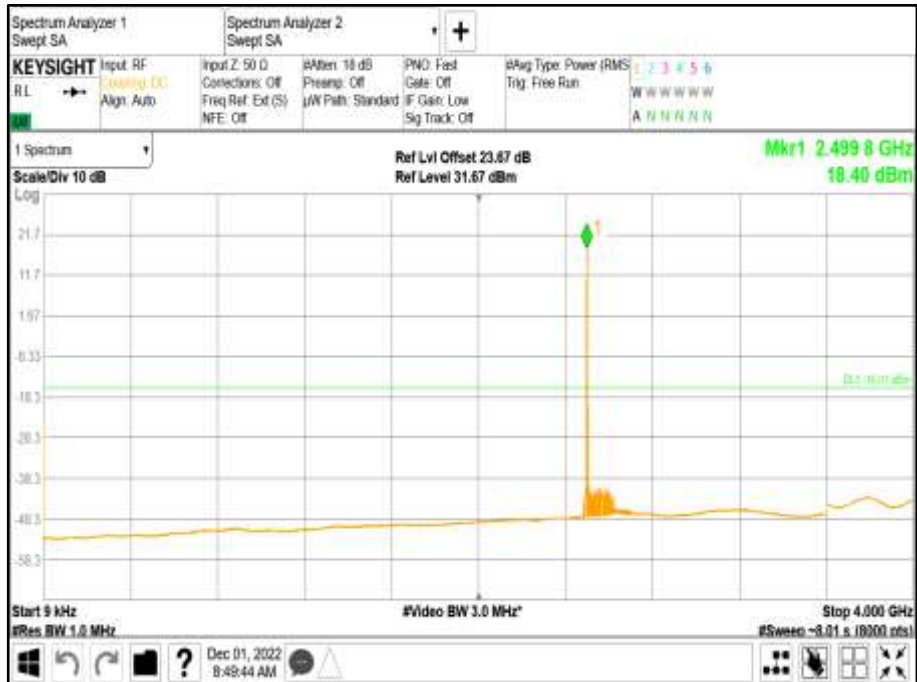
Maximum Output Power 24.00 dBm / Port

Remarks

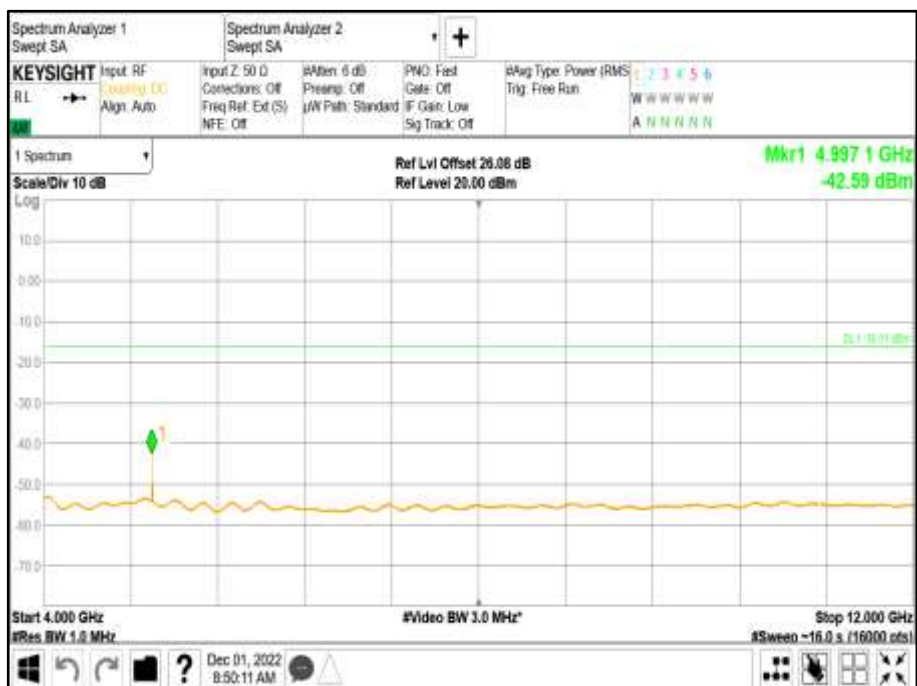
1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Representative spurious emissions performance using the most narrow channel bandwidth has been presented for all modulations. The smallest Ch BW has been found to result in the worst case performance.
3. Plot data performance for all channel bandwidths, and channel positions are on file and available on request.



Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B - Band 1
- Range 0.009 to 4000 MHz



Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B - Band 2
- Range 4000 to 12000 MHz





Antenna A - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B - Band 3
- Range 12000 to 27000 MHz



Antenna A - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B - Band 1
- Range 0.009 to 4000 MHz





Antenna A - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz



Antenna A - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz





Configuration B

Maximum Output Power 26.00 dBm / Port

Remarks

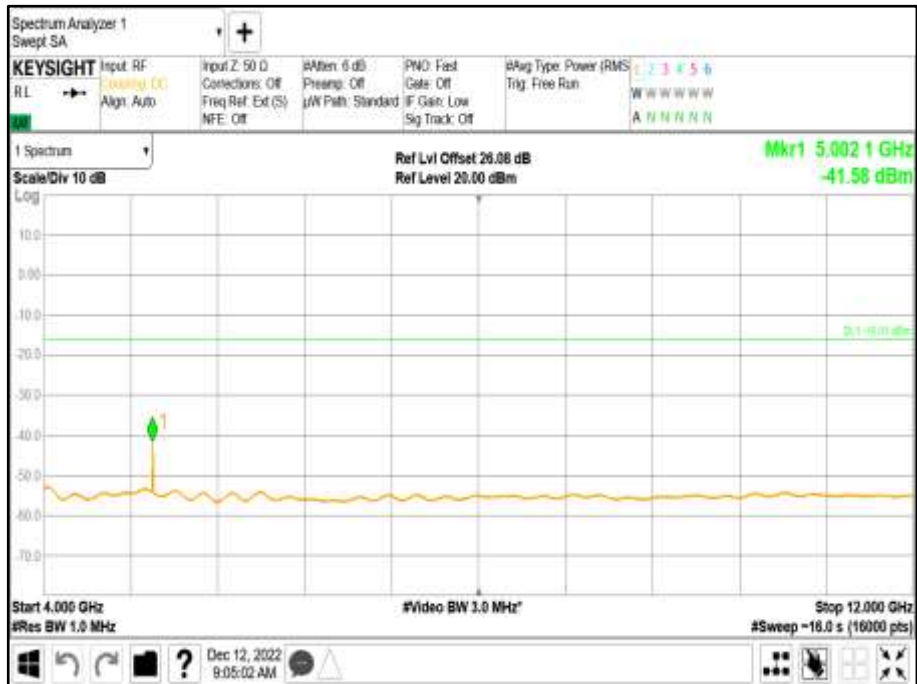
1. Representative worst-case spurious emissions performance has been presented.
2. * represents a non-contiguous channel configuration.
3. All channel BW plots are available upon request.



Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth L5.0+L5.0 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz

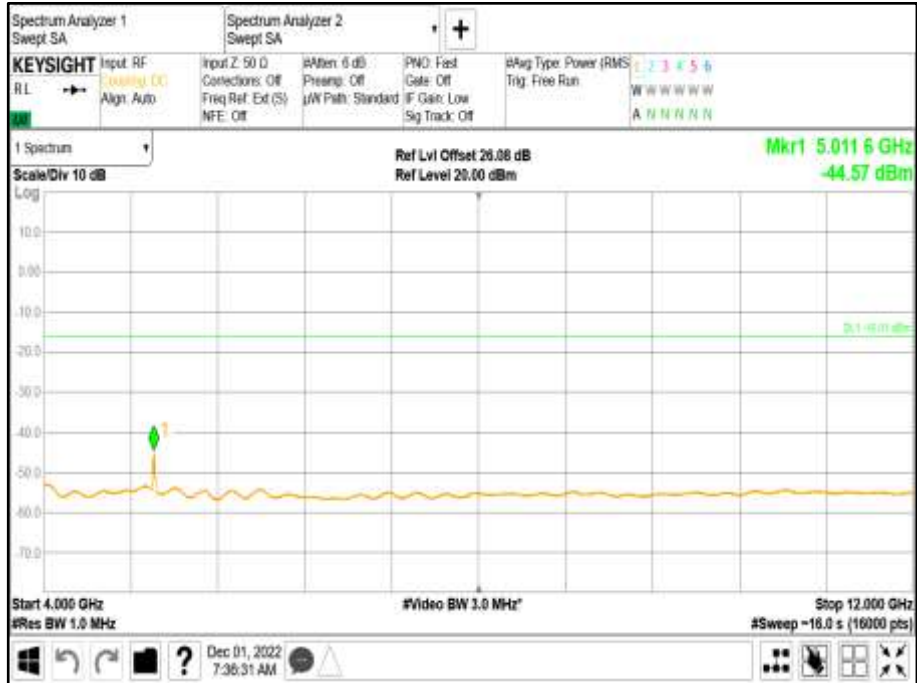


Antenna A - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz





Antenna A - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz

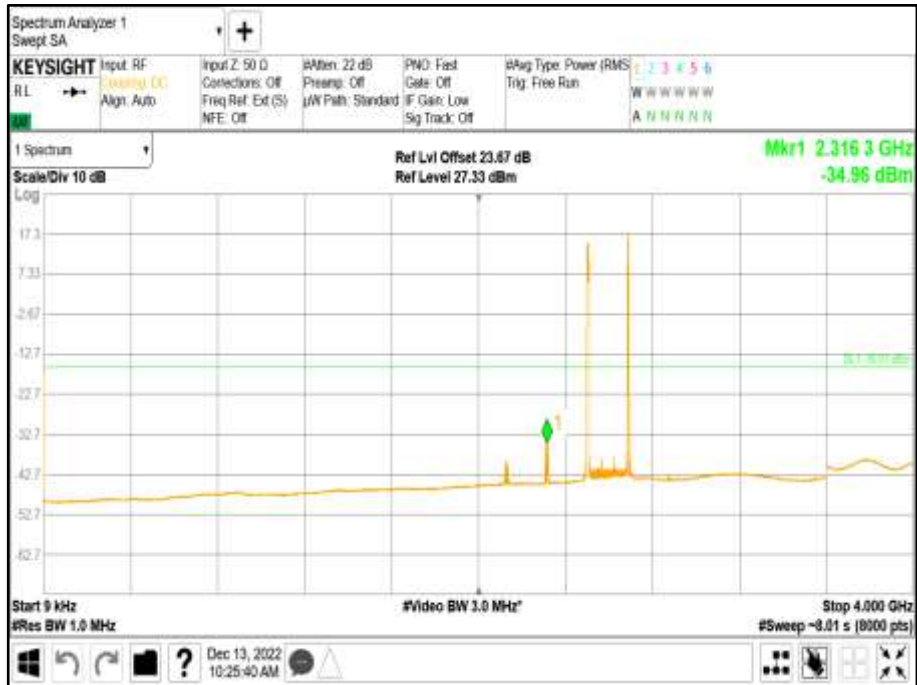


Antenna A - Modulation NR10: QPSK - Carrier Bandwidth NR10+NR10 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz

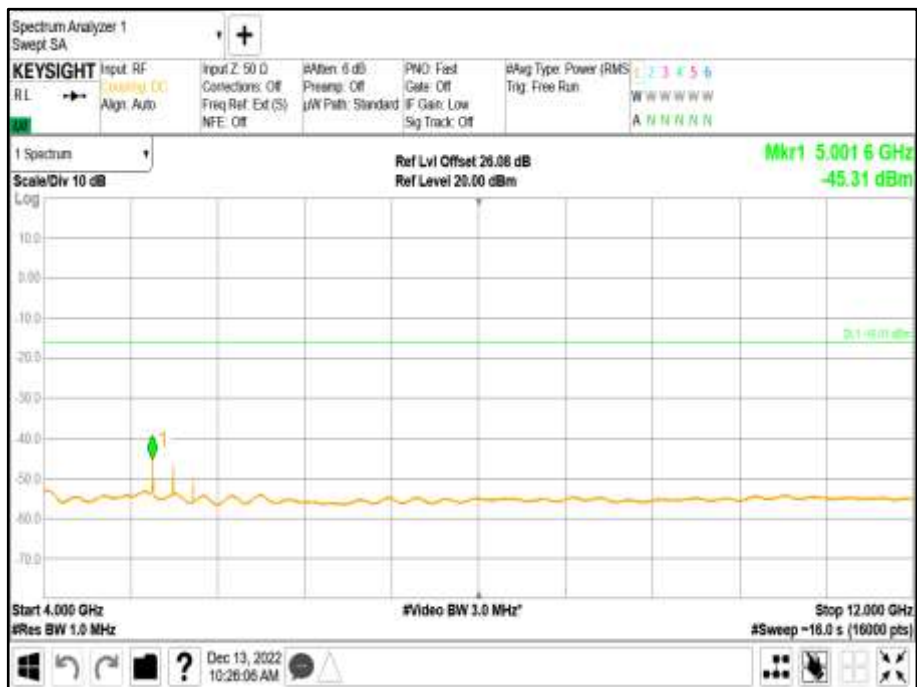




Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * NR10+L5 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz





Configuration C

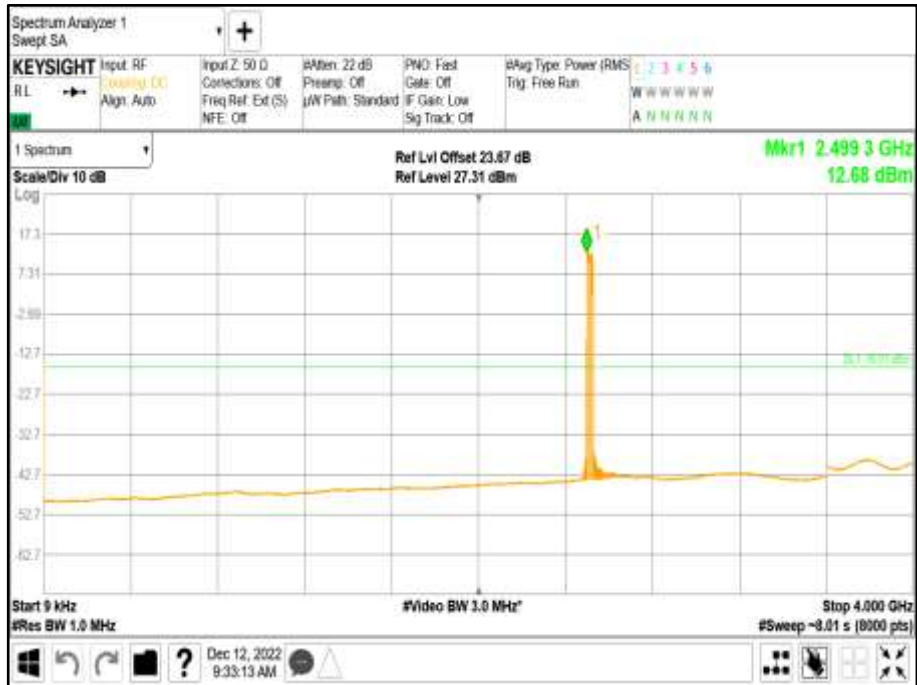
Maximum Output Power 26.00 dBm / Port

Remarks

1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Representative spurious emissions performance using the most narrow channel bandwidth has been presented. The smallest Ch BW has been found to result in the worst case performance.
3. * represents non-contiguous configuration.
4. Plot data performance for all channel bandwidths, and channel positions are on file and available on request.



Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Antenna A - Modulation LTE5: QPSK - Carrier Bandwidth 5+5+5+5+5+5 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz

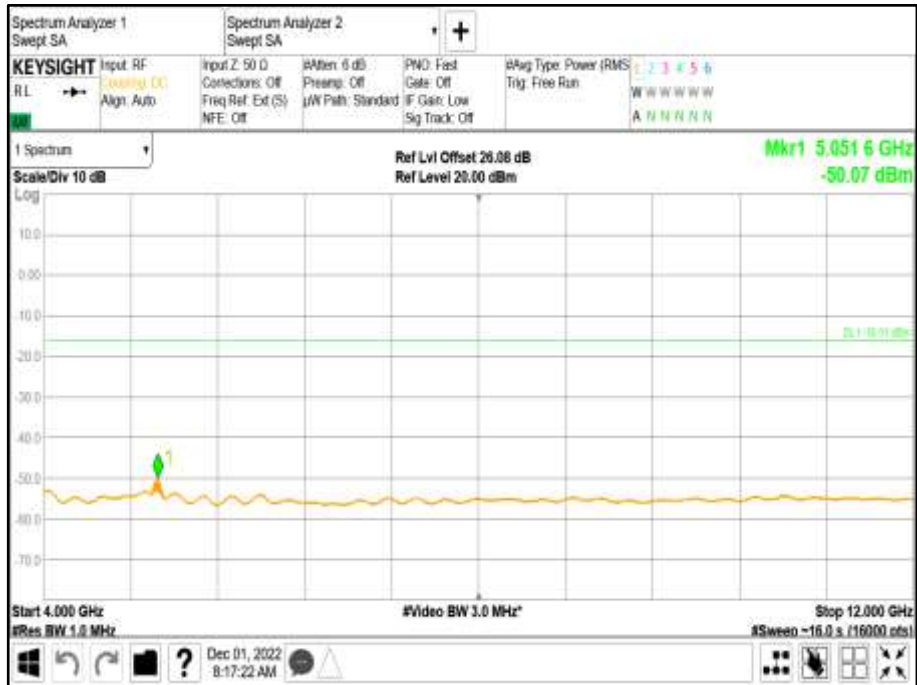


Antenna A - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz





Antenna A - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz

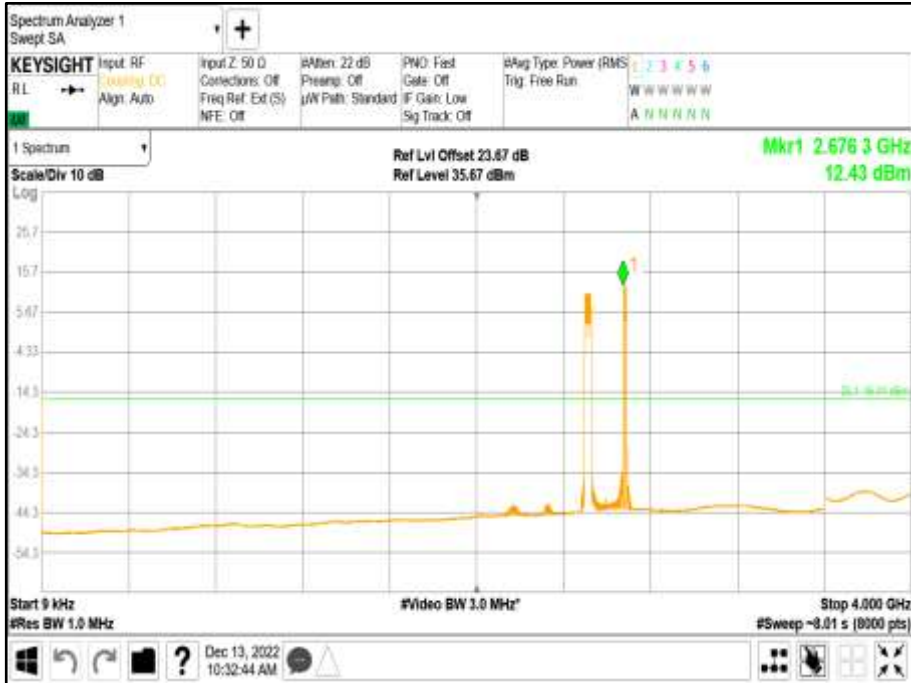


Antenna A - Modulation NR10: QPSK - Carrier Bandwidth 10+10+10+10+10+10 MHz - Channel Position B - Band 3 - Range 12000 to 27000 MHz

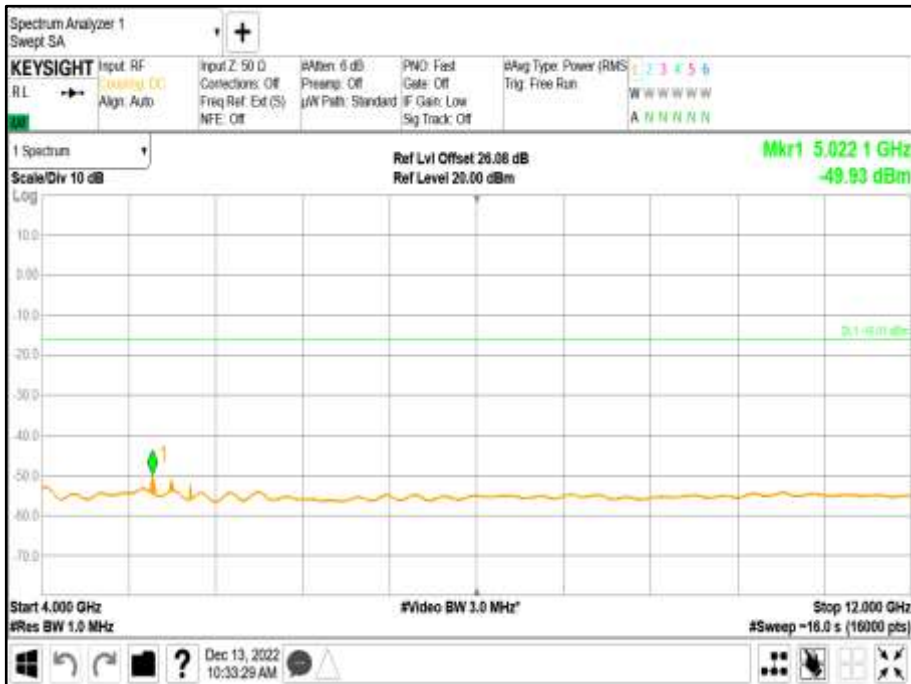




Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * 10+10+10+5+5+5 MHz - Channel Position B - Band 1 - Range 0.009 to 4000 MHz



Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * 10+10+10+5+5+5 MHz - Channel Position B - Band 2 - Range 4000 to 12000 MHz





Antenna A - Modulation * NR10+LTE5: QPSK - Carrier Bandwidth * 10+10+10+5+5+5 MHz -
Channel Position B - Band 3 - Range 12000 to 27000 MHz



Limit	-16 dBm
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2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055

2.5.2 Date of Test and Modification State

06-December-2022 - Modification State 0

2.5.3 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.5.4 Environmental Conditions

Ambient Temperature 24.3°C
Relative Humidity 30.9%

2.5.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01, Clause 9 and ANSI C63.26 Clause 5.6

2.5.6 Test Results

Configuration A

Maximum Output Power 24.00 dBm / Port

Temperature	Voltage	B41 Frequency Error (Hz)
		Channel Position B (2 593 000 000 Hz)
-30°C	-48.0 V DC	Transmitter shuts off
-20°C	-48.0 V DC	Transmitter shuts off
-10°C	-48.0 V DC	1.2002
0°C	-48.0 V DC	2.0804
+10°C	-48.0 V DC	1.2391
+20°C	-40.5 V DC	1.1567
+20°C	-48.0 V DC	1.7245
+20°C	-57.5 V DC	1.6345
+30°C	-48.0 V DC	1.0722
+40°C	-48.0 V DC	-2.2251
+50°C	-48.0 V DC	1.2272

Remarks

Worst Case deviation = -0.00085812 ppm

Limit	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.
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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Keysight	PXA N9030B	MY57144347	12	25/03/2023
Thermometer / Refrigeration	VWR	89094-746	210697579	24	13/08/2023
PSU	Xantrex	XKW60-50	E00109862	-	O/P Mon
Attenuator (20dB)	Mini-Circuits	BW-K10-2W44+	-	-	O/P Mon
Switching Control Unit	HP	11713A	3748A060876	-	O/P Mon
Climate Chamber	Burnsco	RTC-37P-3-3	-07-07	-	O/P Mon

O/P Mon – Output Monitored with Calibrated Equipment



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU	
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	± 0.7 dB	
Conducted Emissions	30 MHz to 20 GHz Amplitude	± 2.1 dB	
Frequency Stability	30 MHz to 2 GHz	± 5.0 Hz	
Occupied Bandwidth	Up to 20 MHz Bandwidth	5 MHz Bandwidth	± 11547 Hz
		10 MHz Bandwidth	± 23094 Hz
		15 MHz Bandwidth	± 34641 Hz
		20 MHz Bandwidth	± 46188 Hz
Band Edge	30 MHz to 20 GHz Amplitude	±0.8 dB	
Radiated Spurious Emissions	30 MHz to 1 GHz	± 5.2 dB	
	1 GHz to 40GHz	± 6.3 dB	

Measurement Uncertainty Decision Rule

Determination of conformity with the specification limits is based on the results of the compliance measurement and does not take into account measurement instrumentation uncertainty as defined in ANSI C63.26:2015 Clause 1.3.

Risk: The uncertainty of measurement about the measured result is negligible with regard to the final pass/fail decision. The measurement result can be directly compared with the test limit to determine conformance with the requirement (compare IEC Guide 115). The level of risk to falsely accept and falsely reject items is further described in ILAC-G8



SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our A2LA Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our A2LA Accreditation.

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TUV SUD Canada, 1280 Teron Rd., Kanata On.

ANNEX A

MODULE LIST

Configuration A/B/C			
Product	Product No	R-State	Serial No
Dot 2266 B48B41B25B66 (EUT)	KRY 901 537/2	R1B	TD3W388627
CT11	LPC 102 494/1	R2A	T01G495060
IRU 1648	KRC 161 842/1	R1E	TD3F117342
IRU 1649 *	KRC 161 842/2	R1E	TD3F109016
Software:	CXP2030045/26	Revision:	R15A701