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Report On

FCC Testing of the
Ericsson Dot 4469 B48, KRY 901 516/2, Dot 4459 B48, KRY 901
516/1, LTE, NR, NR + LTE (3550-3700 MHz) Base Station in
accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 96

COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRY901516-1

PREPARED BY

A handwritten signature in black ink, appearing to read 'Steve McFarlane'.

Steve McFarlane
Test Engineer

APPROVED BY

A handwritten signature in black ink, appearing to read 'Glen Westwell'.

Glen Westwell
Authorised Signatory

DATED

3-March, 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 4469 B48 - KRY 901 516/2
Serial Number(s)	TD3W213282
Software Version	CXP2030045/26 Revision R12A08
Hardware Version	R1A
Non-Tested Variant (See Section 1.10 Additional Information)	Dot 4459 B48 - KRY 901 516/1
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2021 FCC CFR 47 Part 96: 2021
Test Plan	Dot 4469 B48_RA-FCC_testplan_LTE_NR_(TUV SUD) - 2022-2-25
Start of Test	15-March-2022 and Feb 28, 2023 for PSD retest
Finish of Test	13-April-2022 and Feb 28, 2023 for PSD retest
Name of Engineer(s)	Steve McFarlane Glen Westwell
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 KDB 484596 D01 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 96: 2021. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Steve McFarlane



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 96, and is shown below.

Section	Specification Clause		Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 96		
2.1	2.1046	96.41 (b)(c)(g)	Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	96.41 (e)(3)	Occupied Bandwidth	Pass
2.3	2.1051	96.41 (e)(3)	Band Edge	Pass
2.4	2.1051	96.41 (e)(1)	Transmitter Spurious Emissions	Pass
2.5	2.1055	--	Frequency Stability	Pass



1.3 TEST RATIONALE, JUSTIFICATIONS AND DEVIATIONS

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.

The TA8AKRY901516-1 and TA8AKRY901516-2 models represent the same hardware, with the exception that the TA8AKRY901516-1 has internal antenna(s) and the TA8AKRY901516-2 provides for antenna's to be remoted externally. Antenna port conducted testing was performed on the external antenna version and any applicable PSD radiated testing was performed using the internal antenna version. The TA8AKRY901516-3 and TA8AKRY901516-4 variants are represented by the testing performed on TA8AKRY901516-1 and TA8AKRY901516-2 variants, and vice versa where applicable, as these variants represent different end-user functionality and labelling that does not affect the RF performance.

As a worst case preliminary reading, PSD was performed via the conducted method as described in ANSI C63.26 Section 5.2.4.5 and 5.2.4.4.2. The highest PSD value obtained was adjusted as per ANSI C63.26 Section 5.2.5, and summed as per ANSI C 63.26 Section 6.4.3.2.4. Where this worst case calculated value exceeded the applicable limit, the radiated method as per ANSI C 63.26 Section 5.2.7 was deemed necessary to demonstrate compliance and was then performed in accordance with ANSI C63.26 Section 5.5.4, at a site complying with requirements in ANSI C63.10. In summary, in the case where the calculated PSD value exceed PSD radiated limit, the radiated value was obtained at 3 meters is reported for the PSD reading.

1.4 CONFIGURATION DESCRIPTION

Configuration A					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	1	5 MHz	3552.5	3625.0	3697.5
		10 MHz	3555.0	3625.0	3695.0
		20 MHz	3560.0	3625.0	3690.0
NR	1	20 MHz	3560.0	3625.0	3690.0
		30 MHz	3565.0	3625.0	3685.0
		40 MHz	3570.0	3625.0	3680.0
		50 MHz	3575.0	3625.0	3675.0
		60 MHz	3580.0	3625.0	3670.0
		70 MHz	3585.0	3625.0	3665.0
		80 MHz	3590.0	3625.0	3660.0
		90 MHz	3595.0	3625.0	3655.0
		100 MHz	3600.0	3625.0	3650.0

Configuration B					
RAT	No. of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	2	10+10 MHz	3555.0+3565.0	3620.0+3630.0	3685.0+3695.0
		20+20 MHz	3560.0+3580.0	3615.0+3635.0	3670.0+3690.0
*LTE	2	10+10 MHz	-	3555.0 + 3695.0	-
		20+20 MHz	-	3560.0 + 3690.0	-
NR	2	20+20 MHz	3560.0+3580.0	3615.0+3635.0	3670.0+3690.0
		70+70 MHz	3585.0+3655.0	3590.0+3660.0	3595.0+3665.0
*NR	2	20+20 MHz	-	3560.0 + 3690.0	-
		70+70 MHz	-	3585.0 + 3665.0	-
NR+LTE	2	20+10 MHz	3560.0+3575.0	3620.0+3635.0	3680.0+3695.0
*NR+LTE	2	20+10 MHz	-	3560.0+3695.0	-



Configuration C					
RAT	No. of Carriers	Carrier BW	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	7	20 MHz	3560.0+3580.0+3600.0+3620.0+3640.0+3660.0+3680.0	3565.0+3585.0+3605.0+3625.0+3645.0+3665.0+3685.0	3570.0+3590.0+3610.0+3630.0+3650.0+3670.0+3690.0
			3560.0+3580.0+3600.0+3620.0+3640.0+3660.0+3680.0	3565.0+3585.0+3605.0+3625.0+3645.0+3665.0+3685.0	3570.0+3590.0+3610.0+3630.0+3650.0+3670.0+3690.0
*NR	7	20 MHz	-	3560.0+3580.0+3600.0+3620.0+3650.0+3670.0+3690.0	-
			-	3560.0+3580.0+3600.0+3620.0+3650.0+3670.0+3690.0	-

Configuration D					
RAT	No. of Carriers	Carrier BW	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
LTE	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0	3570.0+3580.0+3590.0+3600.0+3610.0+3620.0+3630.0+3640.0+3650.0+3660.0+3670.0+3680.0	3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0
3NR+9LTE	12	20+10 MHz	3560.0+3580.0+3600.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0		
*LTE	12	10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0		
*2NR+10LTE	12	20+10 MHz	3560.0+3580.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0		

Note: * indicates Non-contiguous configurations.



1.5 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Dot
MANUFACTURER	Ericsson
TYPE	Remote Radio Base Station
PART NUMBER	KRY 901 516/1 and KRY 901 516/2 KRY 901 516/3 and KRY 901 516/4
SERIAL NUMBER	TD3W213282 TD3W262402 (PSD Retest)
HARDWARE VERSION	R1A
SOFTWARE VERSION	CXP 203 0045/26 - R12A108
TRANSMITTER OPERATING RANGE	3550 – 3700 MHz
RECEIVER OPERATING RANGE	3550 – 3700 MHz
COUNTRY OF ORIGIN	China
INTERMEDIATE FREQUENCIES	None
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE: 5M00W7D, 10M0W7D, 20M0W7D NR: 20M0F9W, 30M0F9W, 40M0F9W, 50M0F9W, 60M0F9W, 70M0F9W, 80M0F9W, 90M0F9W ,100MF9W
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM, 64QAM, 256QAM NR: QPSK, 16QAM, 64QAM, 256QAM
HIGHEST INTERNALLY GENERATED FREQUENCY	3.7 GHz
OUTPUT POWER (W or dBm)	4 x 0.4W (26dBm)
Antenna gain (dBi)	5.29 dBi
FCC ID	TA8AKRY901516-1 & TA8AKRY901516-2
INDUSTRY CANADA ID	NA
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Dot 4459 B48 (KRY 901 516/1) and the Dot 4469 B48 (KRY 901 516/2) 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 4 Transmit ports in MRO (NR); Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 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 4459 and 4469 radios are identical except that Dot 4459 has internal antennas and Dot 4469 has external ports.

Signature:

.....
Denis Lalonde

Date: 11 April 2022



Declaration of Build Status Serial Number: TD3W213282

1.6 PRODUCT INFORMATION

1.6.1 Technical Description

The Equipment Under Test (EUT) Dot 4469 B48 - KRY 901 516/2 is an Ericsson AB Radio Unit working in the Citizens Broadband Radio Service which provides communication connections to Band 48 network. The EUT operates from a -48V DC supply.

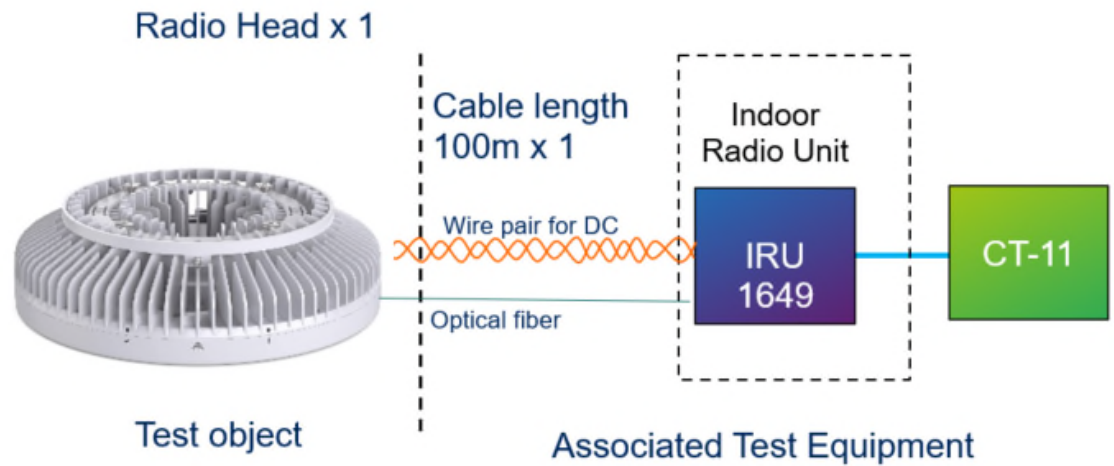
The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



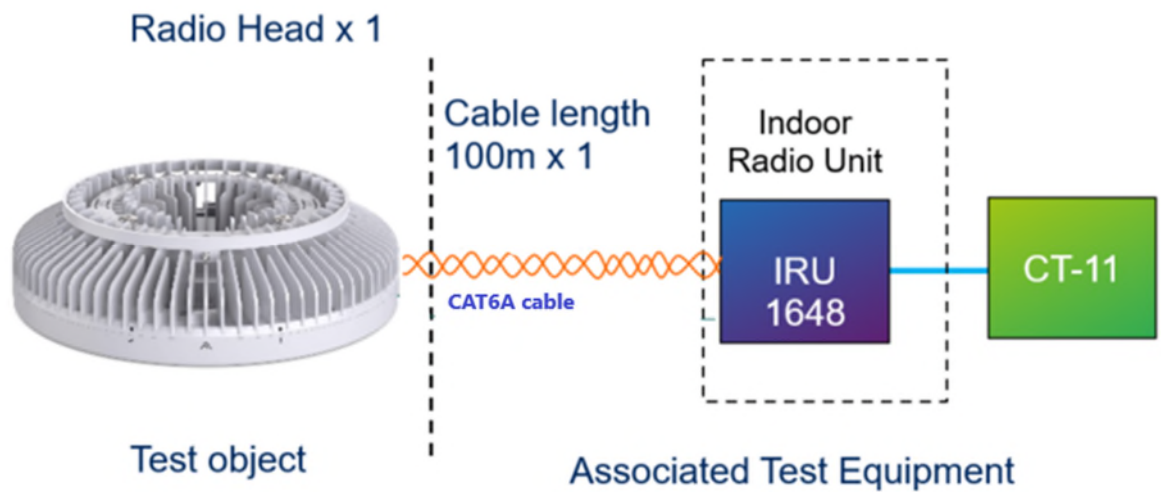
Equipment Under Test

1.7 TEST SETUP

Conducted Test Set Up – Non Contiguous



Conducted Test Set Up – Contiguous





1.8 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 -48V DC supply.

FCC Measurement Facility Registration Number
CA4810 TÜV SÜD 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	Steve McFarlane
Occupied Bandwidth	Steve McFarlane
Band Edge	Steve McFarlane
Transceiver Spurious Emissions	Steve McFarlane
Freq. Stab.	Steve McFarlane
PSD - Radiated	Steve McFarlane

1.9 DEVIATION FROM THE STANDARD

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

1.10 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.11 ADDITIONAL INFORMATION

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

FCC ID: TA8AKRY901516-1 & TA8AKRY901516-2

These units represent the same hardware, with the exception that one of the models has internal antenna(s) and the other provides for antenna's to be remoted externally. Antenna port conducted testing was performed on the external antenna version and any applicable PSD radiated testing was performed on the internal antenna version.

2. Transmitter performance was measured for top, mid & bottom channels for contiguous and non-contiguous (NC) operation, where applicable, across all antenna ports as presented in the power measurement tables. Typical performance is presented. All configuration data is on file and available upon request.

3. Initial pre-testing was carried out to determine the worst case modulation scheme by measuring the output power from QPSK, 16QAM, 64QAM and 256QAM on the middle channel of one antenna port. From these tests, it was determined that QPSK was equivalent or the worst case modulation scheme and was used for all final testing.





SECTION 2

TEST DETAILS



2.1 OUTPUT POWER, PEAK TO AVERAGE RATIO & PSD – CONDUCTED & PSD RADIATED

2.1.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (b)(c)(g)
FCC CFR 47 Part 2, Clause 2.1046

2.1.2 Date of Test and Modification State

15 March and 13-April-2022 - Modification State 0
28 February 2023 – PSD Radiated

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	24.6°C
Relative Humidity	30.8%

2.1.5 Test Method

All conducted measurements were made in accordance with FCC KDB 971168 D01, clause 5.2.1 and summed in accordance with FCC KDB 662911 D01. Where this worst case calculated value exceeded the applicable limit, the radiated method as per ANSI C 63.26 Section 5.2.7 was deemed necessary to demonstrate compliance and was then performed in accordance with ANSI C63.26 Section 5.5.4, at a site complying with requirements in ANSI C63.10.

2.1.6 Test Results

Configuration A

Maximum Output Power (EIRP): 30dBm/10 MHz

Configuration B – Radiated PSD measurements

Maximum Output Power (EIRP): 20dBm/1 MHz



Antenna Gain (dBi)	Modulation	Carrier Bandwidth				Peak to Average Ratio (PAR) / PSD / Output Power			
5.29						Channel Position B			
Antenna Port			CCDF	PSD Conducted	PSD Radiated	EIRPSD	Average Power		
			PAR (dB)	dBm/MHz	dBm/MHz	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	LTE: QPSK	5.0 MHz	-	-	-		17.69	17.69	22.98
B	LTE: QPSK	5.0 MHz	9.92	-	-		18.19	18.19	23.48
C	LTE: QPSK	5.0 MHz	-	-	-		18.15	18.15	23.44
D	LTE: QPSK	5.0 MHz	-	-	-		18.10	18.10	23.39
Total			-	-	19.3	19.3	24.06	24.06	29.35
A	LTE: QPSK	10.0 MHz	-	-			17.98	17.98	23.27
B	LTE: QPSK	10.0 MHz	-	-			18.25	18.25	23.54
C	LTE: QPSK	10.0 MHz	9.77	-			18.38	18.38	23.67
D	LTE: QPSK	10.0 MHz	-	-			18.31	18.31	23.60
Total			-	-	18.6	18.6	24.25	24.25	29.54
A	LTE: QPSK	20.0 MHz	-				20.88	17.87	23.16
B	LTE: QPSK	20.0 MHz	-				21.06	18.05	23.34
C	LTE: QPSK	20.0 MHz	-				21.04	18.03	23.32
D	LTE: QPSK	20.0 MHz	10.07				21.07	18.06	23.35
Total			-		18.3	18.3	27.03	24.02	29.31
A	NR: QPSK	20.0 MHz	9.52				20.75	17.74	23.03
B	NR: QPSK	20.0 MHz	-				21.04	18.03	23.32
C	NR: QPSK	20.0 MHz	-				21.25	18.24	23.53
D	NR: QPSK	20.0 MHz	-				21.22	18.21	23.50
Total			-		17.4	17.4	27.09	24.08	29.37
A	NR: QPSK	30.0 MHz	-				22.70	17.93	23.22
B	NR: QPSK	30.0 MHz	-				22.90	18.13	23.42
C	NR: QPSK	30.0 MHz	9.56				23.09	18.32	23.61
D	NR: QPSK	30.0 MHz	-				22.90	18.13	23.42
Total			-	-	18.1	18.1	28.92	24.15	29.44
A	NR: QPSK	40.0 MHz	-	-			24.05	18.03	23.32
B	NR: QPSK	40.0 MHz	9.71	8.22			24.34	18.32	23.61
C	NR: QPSK	40.0 MHz	-	-			24.25	18.23	23.52
D	NR: QPSK	40.0 MHz	-	-			24.33	18.31	23.60
Total			-			19.51	30.26	24.24	29.53
A	NR: QPSK	50.0 MHz	-	-			24.40	17.41	22.70
B	NR: QPSK	50.0 MHz	-	-			24.81	17.82	23.11
C	NR: QPSK	50.0 MHz	9.44	7.94			24.91	17.92	23.21
D	NR: QPSK	50.0 MHz	-	-			24.49	17.50	22.79
Total			-	-		19.23	30.68	23.69	28.98
A	NR: QPSK	60.0 MHz	-	-			23.72	15.94	21.23
B	NR: QPSK	60.0 MHz	-	-			23.96	16.18	21.47
C	NR: QPSK	60.0 MHz	-	-			24.04	16.26	21.55
D	NR: QPSK	60.0 MHz	9.57	6.13			24.14	16.36	21.65
Total			-	-		17.42	29.99	22.21	27.50
A	NR: QPSK	70.0 MHz	-	-			23.71	15.26	20.55
B	NR: QPSK	70.0 MHz	-	-			23.70	15.25	20.54
C	NR: QPSK	70.0 MHz	-	-			23.69	15.24	20.53
D	NR: QPSK	70.0 MHz	9.60	5.62			24.15	15.70	20.99
Total			-	-		16.91	29.84	21.39	26.68
A	NR: QPSK	80.0 MHz	-	-			23.47	14.44	19.73



B	NR: QPSK	80.0 MHz	-	-			23.68	14.65	19.94
C	NR: QPSK	80.0 MHz	-	-			23.39	14.36	19.65
D	NR: QPSK	80.0 MHz	9.50	4.85			24.13	15.10	20.39
Total			-	-		16.14	29.70	20.67	25.96
A	NR: QPSK	90.0 MHz	-	-			23.54	14.00	19.29
B	NR: QPSK	90.0 MHz	-	-			23.81	14.27	19.56
C	NR: QPSK	90.0 MHz	9.38	4.25			24.07	14.53	19.82
D	NR: QPSK	90.0 MHz	-	-			23.82	14.28	19.57
Total			-	-		15.54	29.83	20.29	25.58
A	NR: QPSK	100.0 MHz	-	-			23.80	13.80	19.09
B	NR: QPSK	100.0 MHz	-	-			24.11	14.11	19.40
C	NR: QPSK	100.0 MHz	-	-			24.24	14.24	19.53
D	NR: QPSK	100.0 MHz	9.44	4.05			24.28	14.28	19.57
Total			-	-		15.53	30.13	20.13	25.42



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / PSD / Output Power						
5.29			Channel Position M						
Antenna Port			CCDF	PSD Conducted	PSD Radiated	EIRPSD	Average Power		
			PAR (dB)	dBm/MHz	dBm/MHz	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	LTE: QPSK	5.0 MHz	-				17.81	17.81	23.10
B	LTE: QPSK	5.0 MHz	-				17.87	17.87	23.16
C	LTE: QPSK	5.0 MHz	9.83				18.01	18.01	23.30
D	LTE: QPSK	5.0 MHz	-				17.91	17.91	23.20
Total			-		19.5	19.5	23.92	23.92	29.21
A	LTE: QPSK	10.0 MHz	-				17.70	17.70	22.99
B	LTE: QPSK	10.0 MHz	-				17.88	17.88	23.17
C	LTE: QPSK	10.0 MHz	10.16				18.01	18.01	23.30
D	LTE: QPSK	10.0 MHz	-				18.12	18.12	23.41
Total			-		15.9	15.9	23.95	23.95	29.24
A	LTE: QPSK	20.0 MHz	-				20.65	17.64	22.93
B	LTE: QPSK	20.0 MHz	-				20.44	17.43	22.72
C	LTE: QPSK	20.0 MHz	9.81				20.84	17.83	23.12
D	LTE: QPSK	20.0 MHz	-				20.85	17.84	23.13
Total			-		15.8	15.8	26.72	23.71	29.00
A	NR: QPSK	20.0 MHz	-				20.60	17.59	22.88
B	NR: QPSK	20.0 MHz	-				20.69	17.68	22.97
C	NR: QPSK	20.0 MHz	9.30				20.94	17.93	23.22
D	NR: QPSK	20.0 MHz	-				20.84	17.83	23.12
Total			-		15.7	15.7	26.79	23.78	29.07
A	NR: QPSK	30.0 MHz	-				22.47	17.70	22.99
B	NR: QPSK	30.0 MHz	-				22.68	17.91	23.20
C	NR: QPSK	30.0 MHz	9.89				22.83	18.06	23.35
D	NR: QPSK	30.0 MHz	-				22.72	17.95	23.24
Total			-		16.6	16.6	28.70	23.93	29.22
A	NR: QPSK	40.0 MHz	-	-			23.04	17.02	22.31
B	NR: QPSK	40.0 MHz	-	-			23.43	17.41	22.70
C	NR: QPSK	40.0 MHz	9.12	8.28			23.54	17.52	22.81
D	NR: QPSK	40.0 MHz	-	-			23.41	17.39	22.68
Total			-	-		19.57	29.38	23.36	28.65
A	NR: QPSK	50.0 MHz	-	-			24.07	17.08	22.37
B	NR: QPSK	50.0 MHz	-	-			24.30	17.31	22.60
C	NR: QPSK	50.0 MHz	9.01	8.16			24.48	17.49	22.78
D	NR: QPSK	50.0 MHz	-	-		19.45	24.48	17.49	22.78
Total			-	-			30.36	23.37	28.66
A	NR: QPSK	60.0 MHz	-	-			24.92	17.14	22.43
B	NR: QPSK	60.0 MHz	-	-			25.22	17.44	22.73
C	NR: QPSK	60.0 MHz	9.43	8.25			25.34	17.56	22.85
D	NR: QPSK	60.0 MHz	-	-			25.27	17.49	22.78
Total			-	-		19.54	31.21	23.43	28.72
A	NR: QPSK	70.0 MHz	-	-			25.10	16.65	21.94
B	NR: QPSK	70.0 MHz	-	-			25.62	17.17	22.46
C	NR: QPSK	70.0 MHz	9.60	7.90			25.51	17.06	22.35
D	NR: QPSK	70.0 MHz	-	-		19.19	25.61	17.16	22.45
Total			-	-			31.49	23.03	28.32
A	NR: QPSK	80.0 MHz	-	-			25.37	16.34	21.63
B	NR: QPSK	80.0 MHz	-	-			25.52	16.49	21.78



C	NR: QPSK	80.0 MHz	9.51	7.68		25.75	16.72	22.01
D	NR: QPSK	80.0 MHz	-	-		25.59	16.56	21.85
Total			-	-	18.97	31.58	22.55	27.84
A	NR: QPSK	90.0 MHz	-	-		25.37	15.83	21.12
B	NR: QPSK	90.0 MHz	-	-		25.69	16.15	21.44
C	NR: QPSK	90.0 MHz	9.49	7.20		25.85	16.31	21.60
D	NR: QPSK	90.0 MHz	-	-		25.69	16.15	21.44
Total			-	-	18.49	31.67	22.13	27.42
A	NR: QPSK	100.0 MHz	-	-		25.44	15.44	20.73
B	NR: QPSK	100.0 MHz	-	-		25.86	15.86	21.15
C	NR: QPSK	100.0 MHz	9.47	6.88		25.93	15.93	21.22
D	NR: QPSK	100.0 MHz	-	-		25.92	15.92	21.21
Total			-	-	18,17	31.81	21.81	27.10



Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / PSD / Output Power						
5.29			Channel Position T						
Antenna Port			CCDF	PSD Conducted	PSD Radiated	EIRPSD	Average Power		
			PAR (dB)	dBm/MHz	dBm/MHz	dBm/MHz	dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	LTE: QPSK	5.0 MHz	-				17.56	17.56	22.85
B	LTE: QPSK	5.0 MHz	-				17.89	17.89	23.18
C	LTE: QPSK	5.0 MHz	9.81				18.03	18.03	23.32
D	LTE: QPSK	5.0 MHz	-				17.78	17.78	23.07
Total			-		18.3	18.3	23.84	23.84	29.13
A	LTE: QPSK	10.0 MHz	-				17.65	17.65	22.94
B	LTE: QPSK	10.0 MHz	-				17.99	17.99	23.28
C	LTE: QPSK	10.0 MHz	9.98				18.20	18.20	23.49
D	LTE: QPSK	10.0 MHz	-				17.80	17.80	23.09
Total			-		15.5	15.5	23.94	23.94	29.23
A	LTE: QPSK	20.0 MHz	-				20.66	17.65	22.94
B	LTE: QPSK	20.0 MHz	-				20.63	17.62	22.91
C	LTE: QPSK	20.0 MHz	9.72				20.94	17.93	23.22
D	LTE: QPSK	20.0 MHz	-				20.43	17.42	22.71
Total			-		15.6	15.6	26.69	23.68	28.97
A	NR: QPSK	20.0 MHz	-				20.54	17.53	22.82
B	NR: QPSK	20.0 MHz	-				20.89	17.88	23.17
C	NR: QPSK	20.0 MHz	9.77				20.95	17.94	23.23
D	NR: QPSK	20.0 MHz	-				20.77	17.76	23.05
Total			-		15.3	15.3	26.81	23.80	29.09
A	NR: QPSK	30.0 MHz	-				22.40	17.63	22.92
B	NR: QPSK	30.0 MHz	-				22.88	18.11	23.40
C	NR: QPSK	30.0 MHz	9.75				22.72	17.95	23.24
D	NR: QPSK	30.0 MHz	-				22.81	18.04	23.33
Total			-		16.6	16.6	28.73	23.96	29.25
A	NR: QPSK	40.0 MHz	-				23.05	17.03	22.32
B	NR: QPSK	40.0 MHz	-				23.58	17.56	22.85
C	NR: QPSK	40.0 MHz	9.73				23.39	17.37	22.66
D	NR: QPSK	40.0 MHz	-				23.42	17.40	22.69
Total			-		16.2	16.2	29.38	23.36	28.65
A	NR: QPSK	50.0 MHz	-				24.32	17.33	22.62
B	NR: QPSK	50.0 MHz	-				24.62	17.63	22.92
C	NR: QPSK	50.0 MHz	9.27				24.67	17.68	22.97
D	NR: QPSK	50.0 MHz	-				24.56	17.57	22.86
Total			-	-	16.0	16.0	30.57	23.58	28.87
A	NR: QPSK	60.0 MHz	-	-			25.19	17.41	22.70
B	NR: QPSK	60.0 MHz	-	-			25.41	17.63	22.92
C	NR: QPSK	60.0 MHz	9.46	8.59			25.59	17.81	23.10
D	NR: QPSK	60.0 MHz	-	-			25.56	17.78	23.07
Total			-	-		19.88	31.46	23.68	28.97
A	NR: QPSK	70.0 MHz	-	-			24.81	16.36	21.65
B	NR: QPSK	70.0 MHz	-	-			25.23	16.78	22.07
C	NR: QPSK	70.0 MHz	9.67	7.94			25.31	16.86	22.15
D	NR: QPSK	70.0 MHz	-	-			25.13	16.68	21.97
Total			-	-		19.23	31.14	22.69	27.98
A	NR: QPSK	80.0 MHz	-	-			24.76	15.73	21.02
B	NR: QPSK	80.0 MHz	-	-			25.13	16.10	21.39



C	NR: QPSK	80.0 MHz	9.11	7.62			25.21	16.18	21.47
D	NR: QPSK	80.0 MHz	-	-			25.10	16.07	21.36
Total			-	-		18.91	31.07	22.04	27.33
A	NR: QPSK	90.0 MHz	-	-			24.86	15.32	20.61
B	NR: QPSK	90.0 MHz	-	-			24.92	15.38	20.67
C	NR: QPSK	90.0 MHz	9.33	6.83			25.14	15.60	20.89
D	NR: QPSK	90.0 MHz	-	-			25.20	15.66	20.95
Total			-	-		18.12	31.05	21.51	26.80
A	NR: QPSK	100.0 MHz	-	-			24.96	14.96	20.25
B	NR: QPSK	100.0 MHz	-	-			24.94	14.94	20.23
C	NR: QPSK	100.0 MHz	9.58	6.30			25.24	15.24	20.53
D	NR: QPSK	100.0 MHz	-	-			25.19	15.19	20.48
Total			-	-		17.59	31.11	21.11	26.40

Conducted Transmit Power & EIRP Results

Gain (dBi)	Ant Port	Modulation	Ch. BW	Bottom Ch.			Mid Ch.			Top Ch.	
				dBm	EIRP		dBm	EIRP		dBm	EIRP
5.29	A	LTE: QPSK	5.0 MHz	17.69	22.98		17.81	23.1		17.56	22.85
5.29	B	LTE: QPSK	5.0 MHz	18.19	23.48		17.87	23.16		17.89	23.18
5.29	C	LTE: QPSK	5.0 MHz	18.15	23.44		18.01	23.3		18.03	23.32
5.29	D	LTE: QPSK	5.0 MHz	18.1	23.39		17.91	23.2		17.78	23.07
5.29			Total	24.06	29.35		23.92	29.21		23.84	29.13
5.29	A	LTE: QPSK	10.0 MHz	17.98	23.27		17.7	22.99		17.65	22.94
5.29	B	LTE: QPSK	10.0 MHz	18.25	23.54		17.88	23.17		17.99	23.28
5.29	C	LTE: QPSK	10.0 MHz	18.38	23.67		18.01	23.3		18.2	23.49
5.29	D	LTE: QPSK	10.0 MHz	18.31	23.6		18.12	23.41		17.8	23.09
5.29			Total	24.25	29.54		23.95	29.24		23.94	29.23
5.29	A	LTE: QPSK	20.0 MHz	20.88	26.17		20.65	25.94		20.66	25.95
5.29	B	LTE: QPSK	20.0 MHz	21.06	26.35		20.44	25.73		20.63	25.92
5.29	C	LTE: QPSK	20.0 MHz	21.04	26.33		20.84	26.13		20.94	26.23
5.29	D	LTE: QPSK	20.0 MHz	21.07	26.36		20.85	26.14		20.43	25.72
5.29			Total	27.03	32.32		26.72	32.01		26.69	31.98
5.29	A	NR: QPSK	20.0 MHz	20.75	26.04		20.6	25.89		20.54	25.83



5.29	B	NR: QPSK	20.0 MHz	21.04	26.33		20.69	25.98		20.89	26.18
5.29	C	NR: QPSK	20.0 MHz	21.25	26.54		20.94	26.23		20.95	26.24
5.29	D	NR: QPSK	20.0 MHz	21.22	26.51		20.84	26.13		20.77	26.06
5.29			Total	27.09	32.38		26.79	32.08		26.81	32.1
5.29	A	NR: QPSK	30.0 MHz	22.7	27.99		22.47	27.76		22.4	27.69
5.29	B	NR: QPSK	30.0 MHz	22.9	28.19		22.68	27.97		22.88	28.17
5.29	C	NR: QPSK	30.0 MHz	23.09	28.38		22.83	28.12		22.72	28.01
5.29	D	NR: QPSK	30.0 MHz	22.9	28.19		22.72	28.01		22.81	28.1
5.29			Total	28.92	34.21		28.7	33.99		28.73	34.02
5.29	A	NR: QPSK	40.0 MHz	24.05	29.34		23.04	28.33		23.05	28.34
5.29	B	NR: QPSK	40.0 MHz	24.34	29.63		23.43	28.72		23.58	28.87
5.29	C	NR: QPSK	40.0 MHz	24.25	29.54		23.54	28.83		23.39	28.68
5.29	D	NR: QPSK	40.0 MHz	24.33	29.62		23.41	28.7		23.42	28.71
5.29			Total	30.26	35.55		29.38	34.67		29.38	34.67
5.29	A	NR: QPSK	50.0 MHz	24.4	29.69		24.07	29.36		24.32	29.61
5.29	B	NR: QPSK	50.0 MHz	24.81	30.1		24.3	29.59		24.62	29.91
5.29	C	NR: QPSK	50.0 MHz	24.91	30.2		24.48	29.77		24.67	29.96
5.29	D	NR: QPSK	50.0 MHz	24.49	29.78		24.48	29.77		24.56	29.85
5.29			Total	30.68	35.97		30.36	35.65		30.57	35.86
5.29	A	NR: QPSK	60.0 MHz	23.72	29.01		24.92	30.21		25.19	30.48
5.29	B	NR: QPSK	60.0 MHz	23.96	29.25		25.22	30.51		25.41	30.7
5.29	C	NR: QPSK	60.0 MHz	24.04	29.33		25.34	30.63		25.59	30.88
5.29	D	NR: QPSK	60.0 MHz	24.14	29.43		25.27	30.56		25.56	30.85
5.29			Total	29.99	35.28		31.21	36.5		31.46	36.75
5.29	A	NR: QPSK	70.0 MHz	23.71	29		25.1	30.39		24.81	30.1
5.29	B	NR: QPSK	70.0 MHz	23.7	28.99		25.62	30.91		25.23	30.52



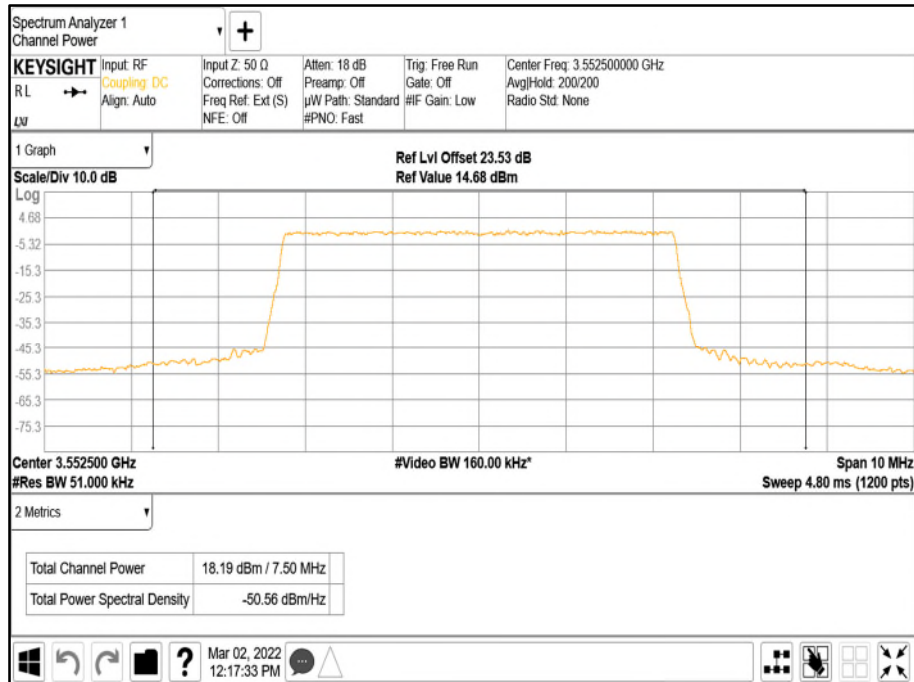
5.29	C	NR: QPSK	70.0 MHz	23.69	28.98		25.51	30.8		25.31	30.6
5.29	D	NR: QPSK	70.0 MHz	24.15	29.44		25.61	30.9		25.13	30.42
5.29			Total	29.84	35.13		31.49	36.78		31.14	36.43
5.29	A	NR: QPSK	80.0 MHz	23.47	28.76		25.37	30.66		24.76	30.05
5.29	B	NR: QPSK	80.0 MHz	23.68	28.97		25.52	30.81		25.13	30.42
5.29	C	NR: QPSK	80.0 MHz	23.39	28.68		25.75	31.04		25.21	30.5
5.29	D	NR: QPSK	80.0 MHz	24.13	29.42		25.59	30.88		25.1	30.39
5.29			Total	29.7	34.99		31.58	36.87		31.07	36.36
5.29	A	NR: QPSK	90.0 MHz	23.54	28.83		25.37	30.66		24.86	30.15
5.29	B	NR: QPSK	90.0 MHz	23.81	29.1		25.69	30.98		24.92	30.21
5.29	C	NR: QPSK	90.0 MHz	24.07	29.36		25.85	31.14		25.14	30.43
5.29	D	NR: QPSK	90.0 MHz	23.82	29.11		25.69	30.98		25.2	30.49
5.29			Total	29.83	35.12		31.67	36.96		31.05	36.34
5.29	A	NR: QPSK	100.0 MHz	23.8	29.09		25.44	30.73		24.96	30.25
5.29	B	NR: QPSK	100.0 MHz	24.11	29.4		25.86	31.15		24.94	30.23
5.29	C	NR: QPSK	100.0 MHz	24.24	29.53		25.93	31.22		25.24	30.53
5.29	D	NR: QPSK	100.0 MHz	24.28	29.57		25.92	31.21		25.19	30.48
5.29			Total	30.13	35.42		31.81	37.1		31.11	36.4



Remarks

1. Transmitter performance has been presented for top, mid, bottom channels accross all antenna ports as represented in the following tables.
2. Typical performance and measurement plot data has been presented for reference.
3. All contiguous and non-contiguous (NC) plot data is on file and available upon request.
4. The worst-case result for the peak-to-average ratio (CCDF) & the power spectral density (PSD) has been presented for comparison to the limits.

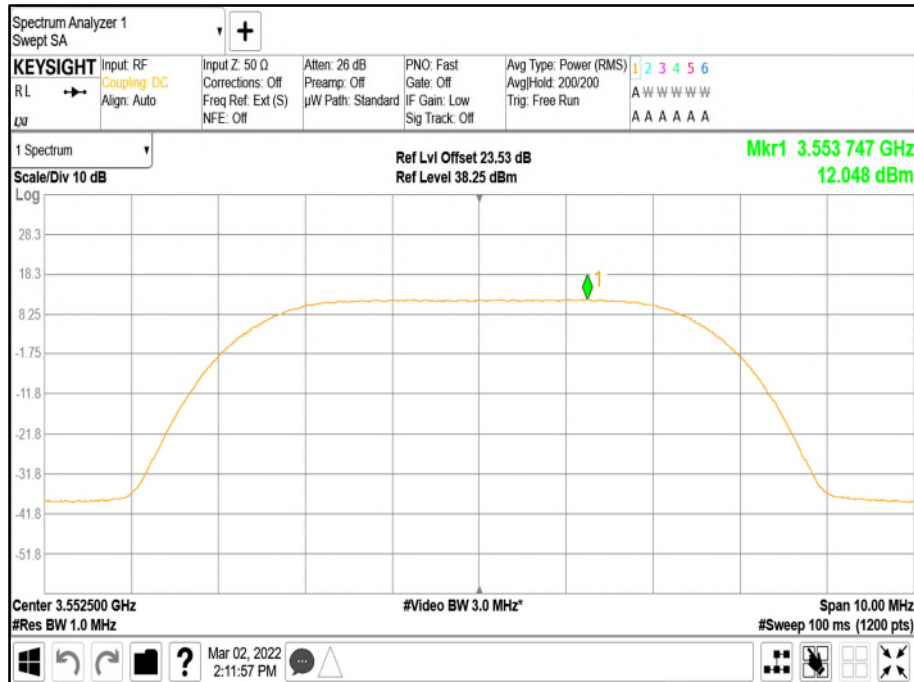
Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B



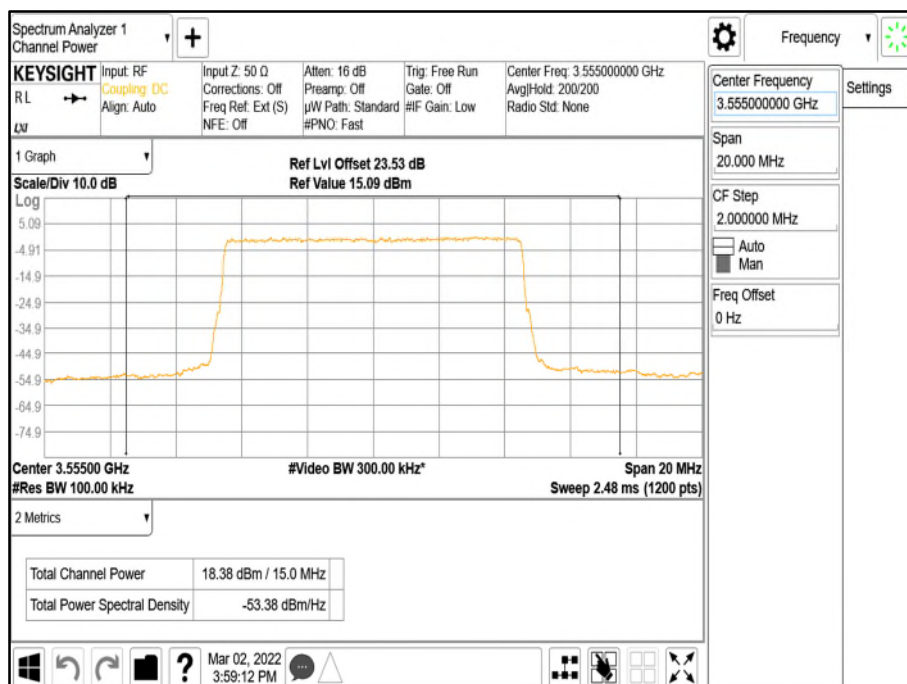
Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B



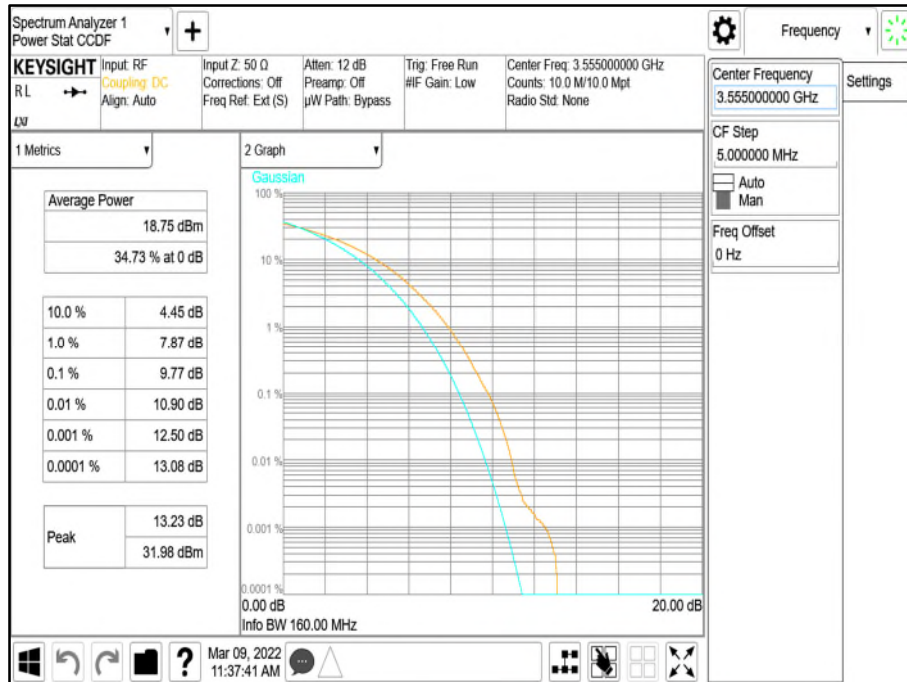
Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B



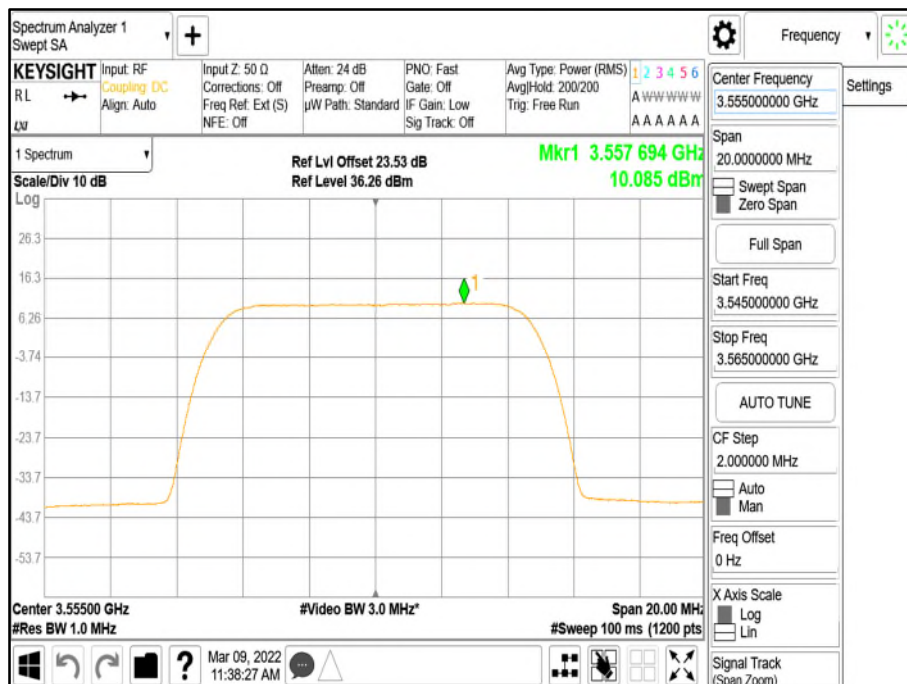
Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



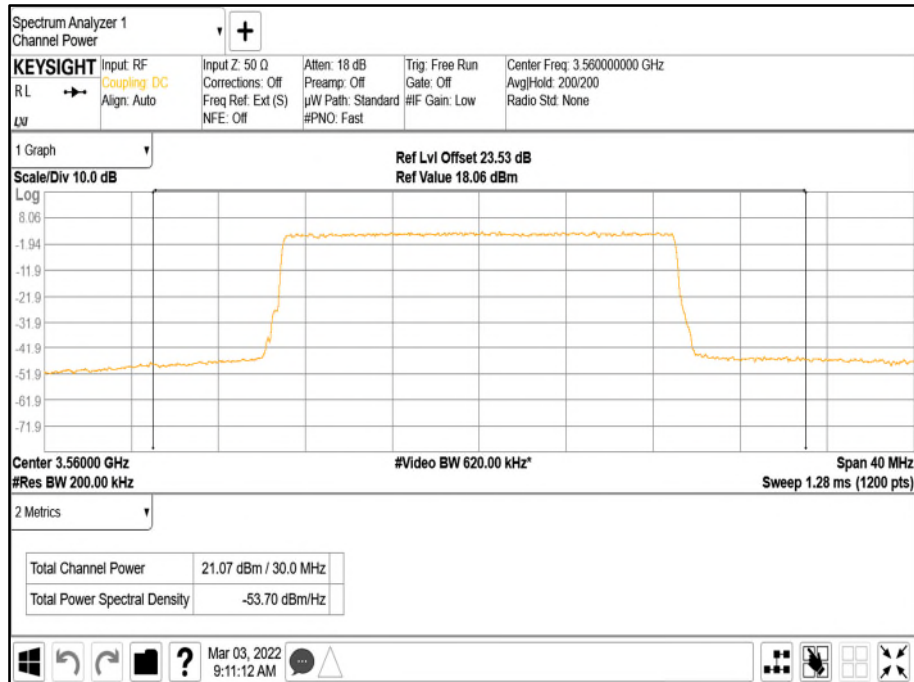
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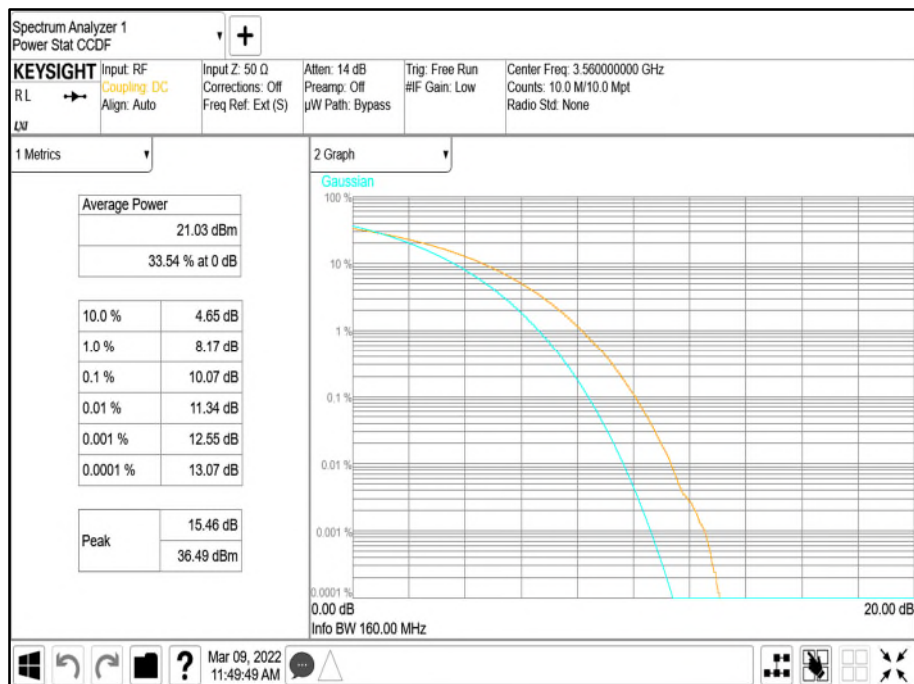
Antenna Port A PSD - Modulation LTE: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



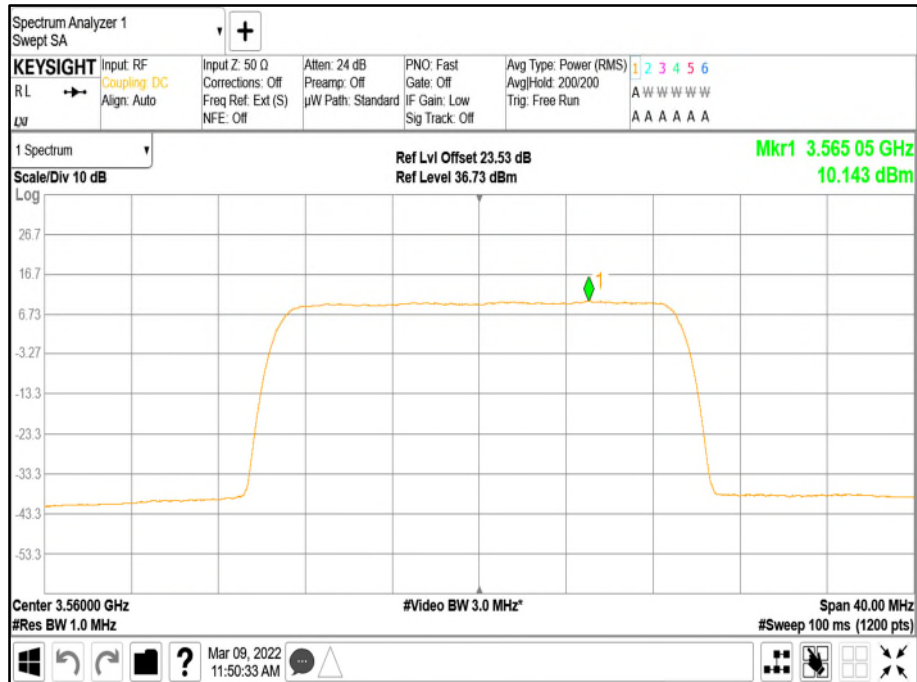
Antenna Port A Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



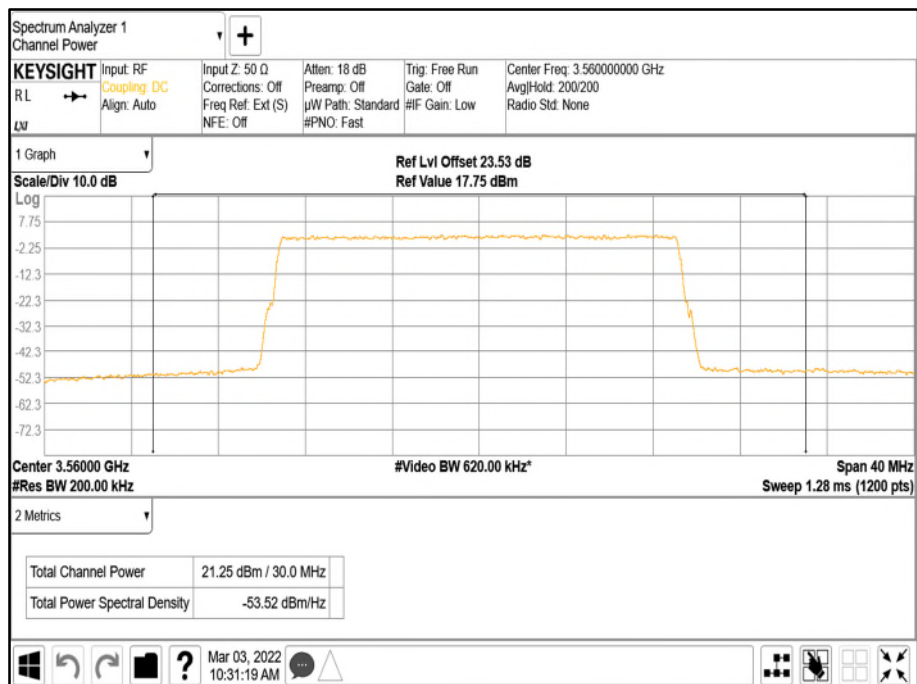
Antenna Port A Pk-Av Ratio - Modulation LTE: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



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



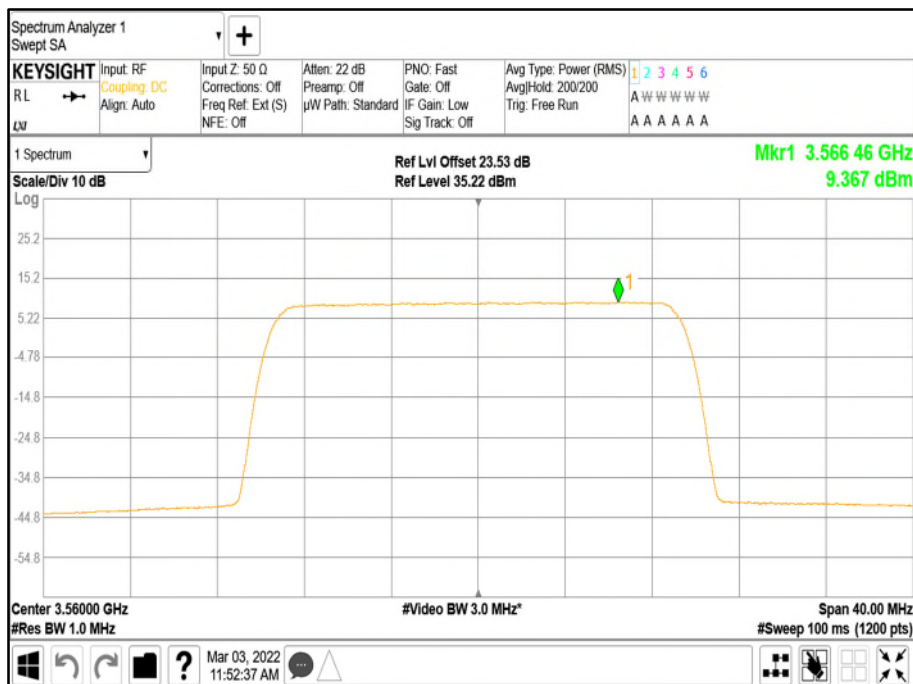
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



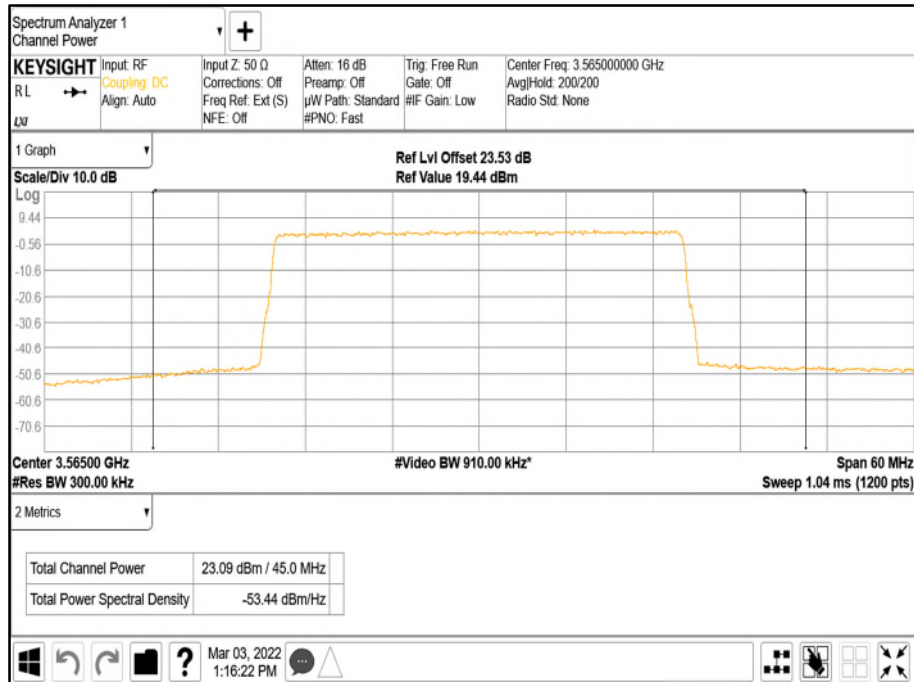
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 20.0 MHz - Channel Position B



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



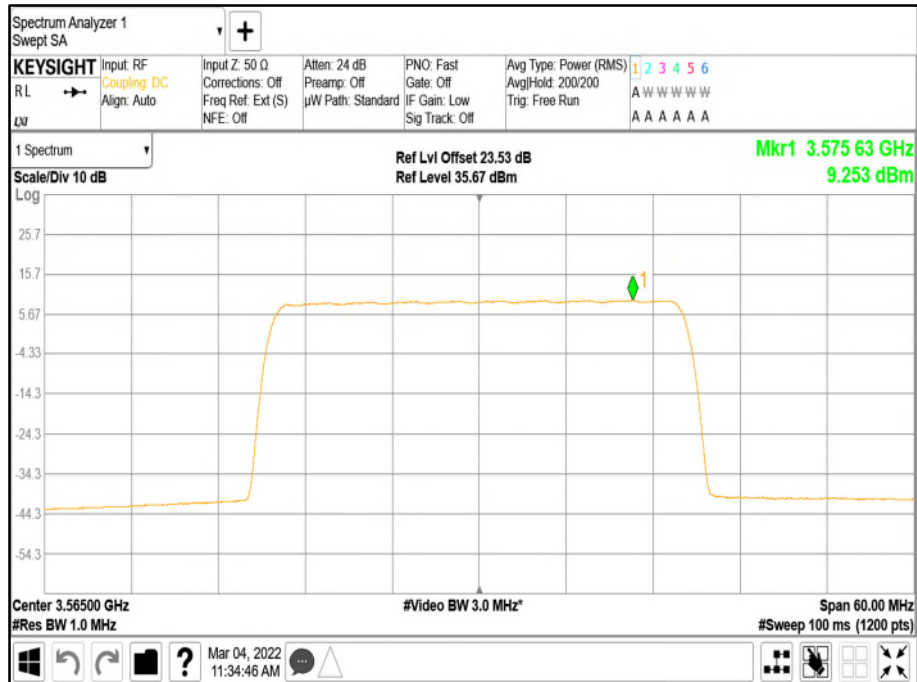
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 30.0 MHz - Channel Position B



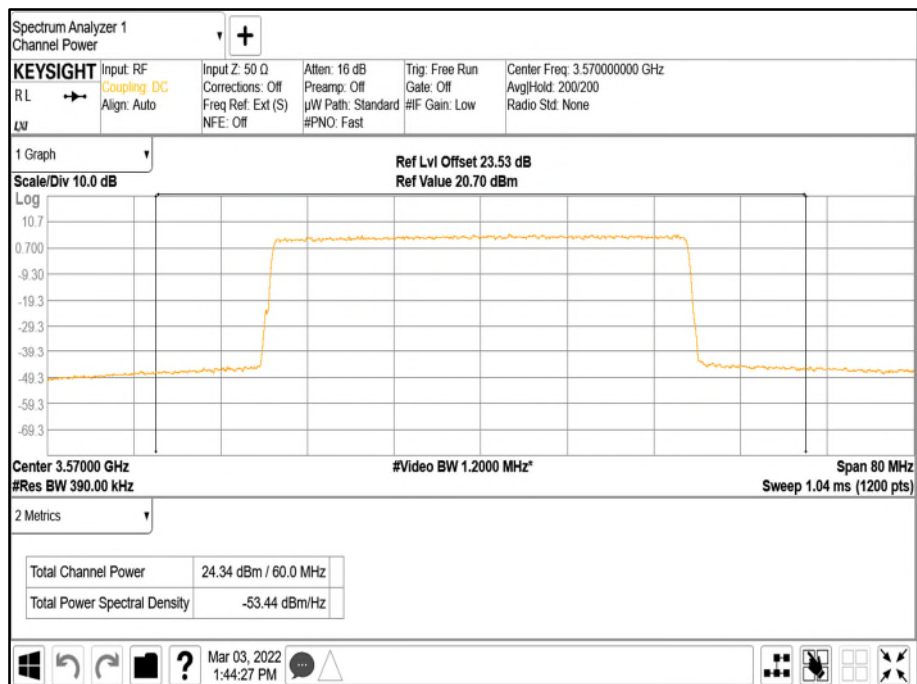
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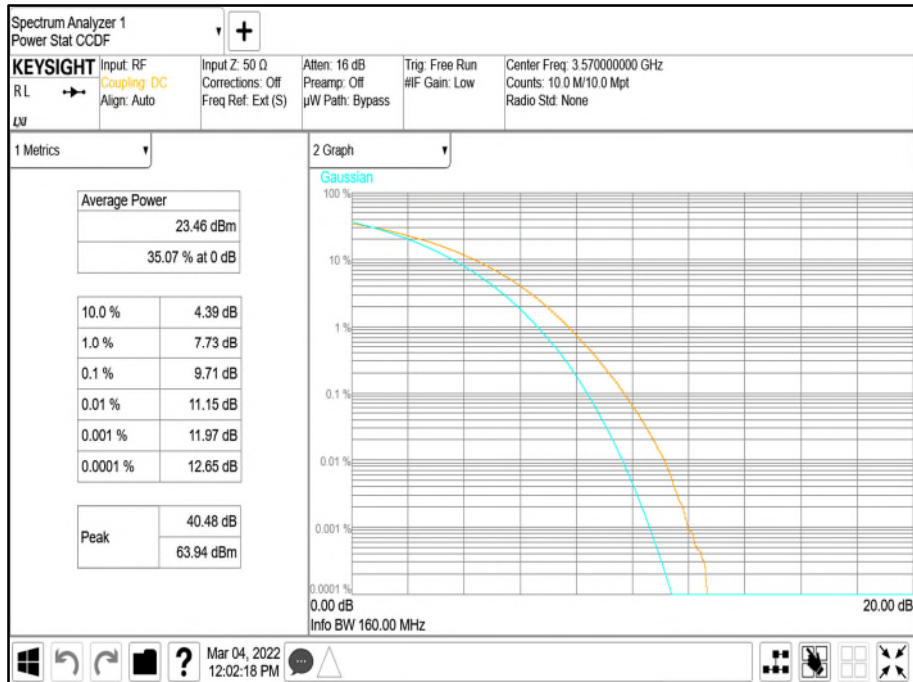
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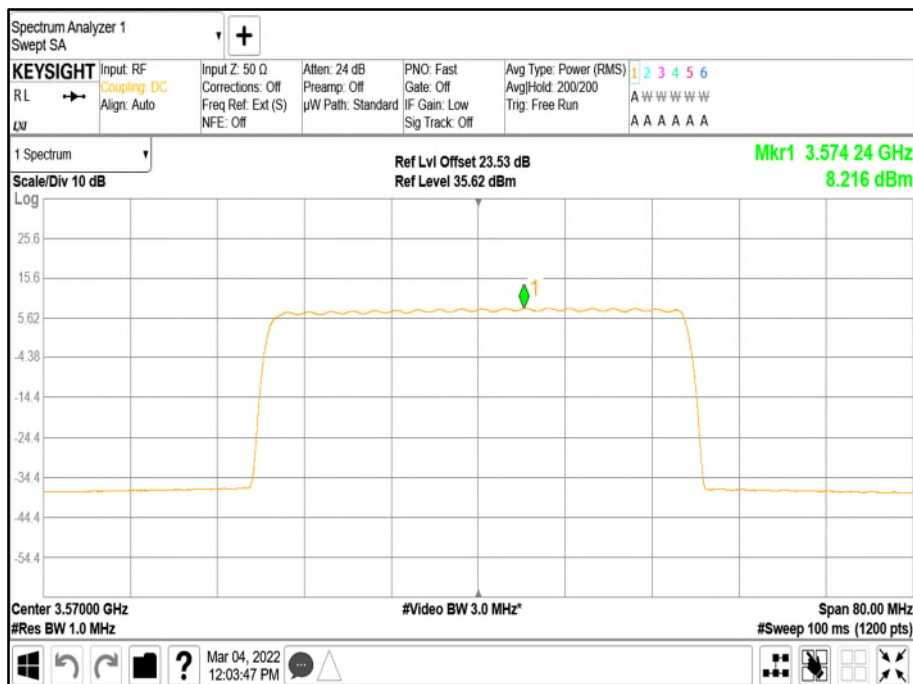
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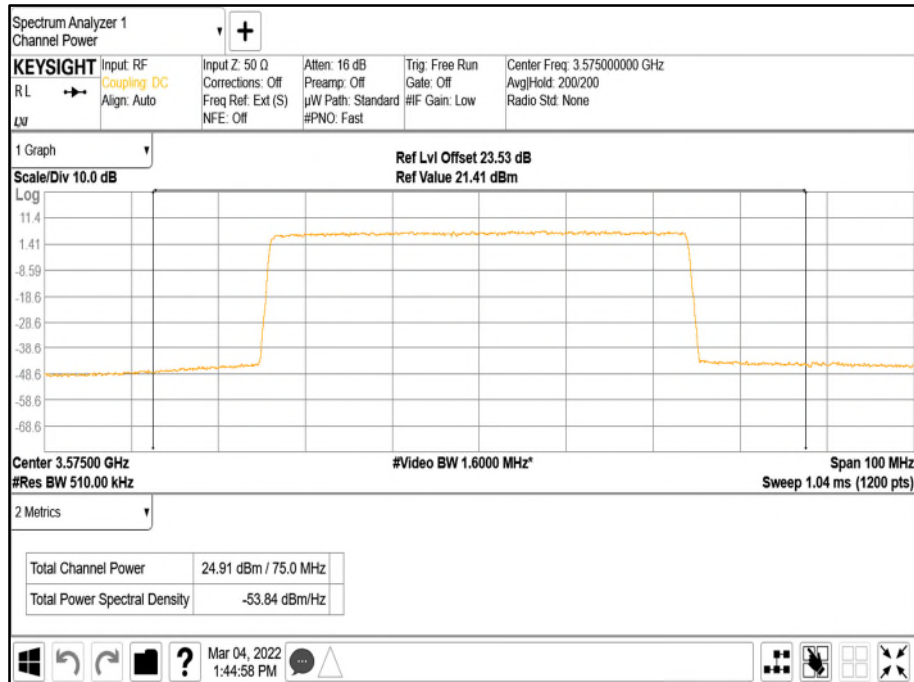
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 40.0 MHz - Channel Position B



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

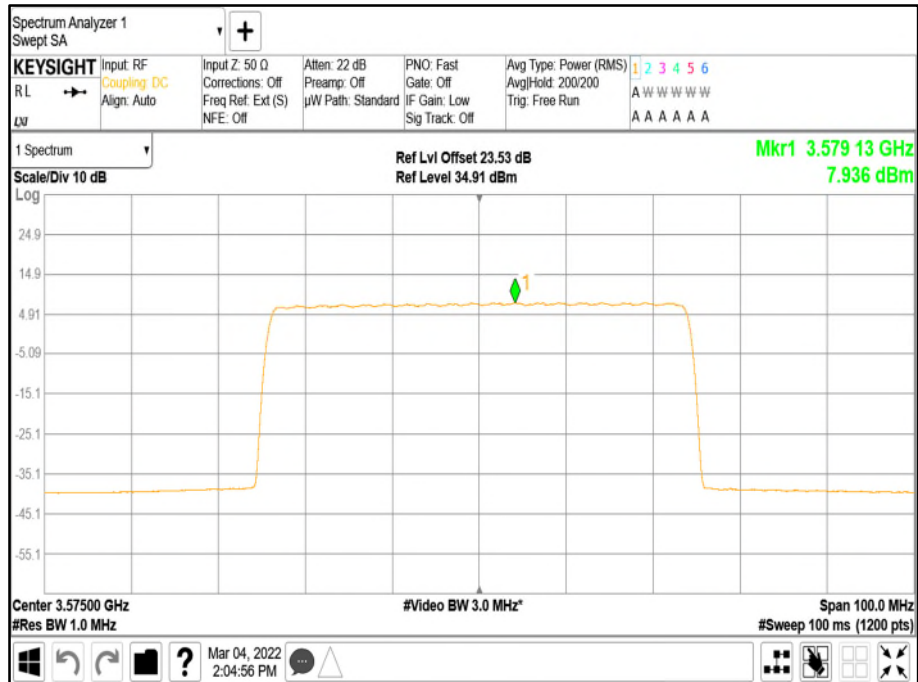


Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 50.0 MHz - Channel Position B

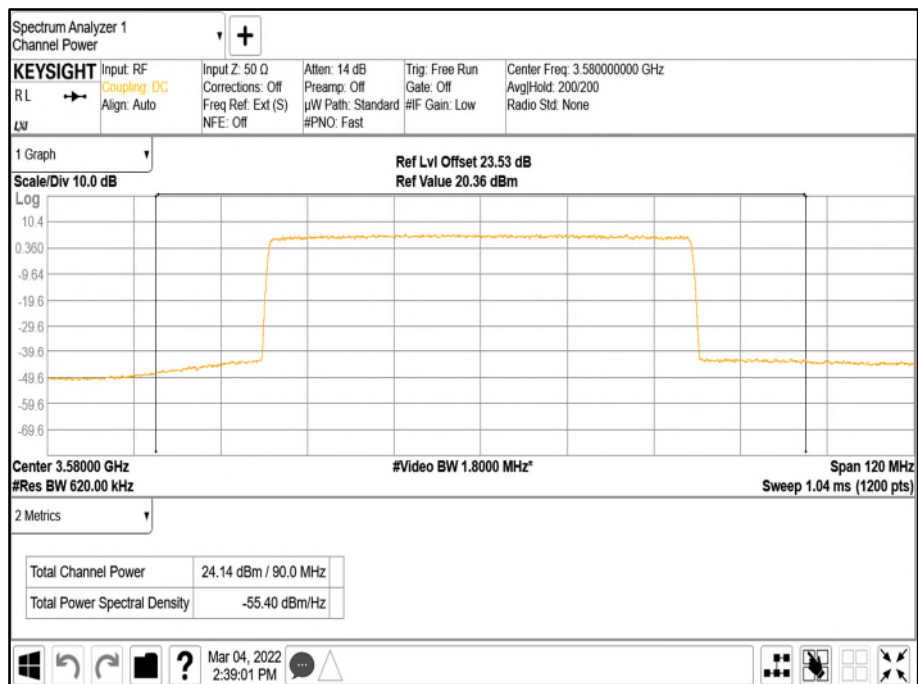




Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 50.0 MHz - Channel Position B



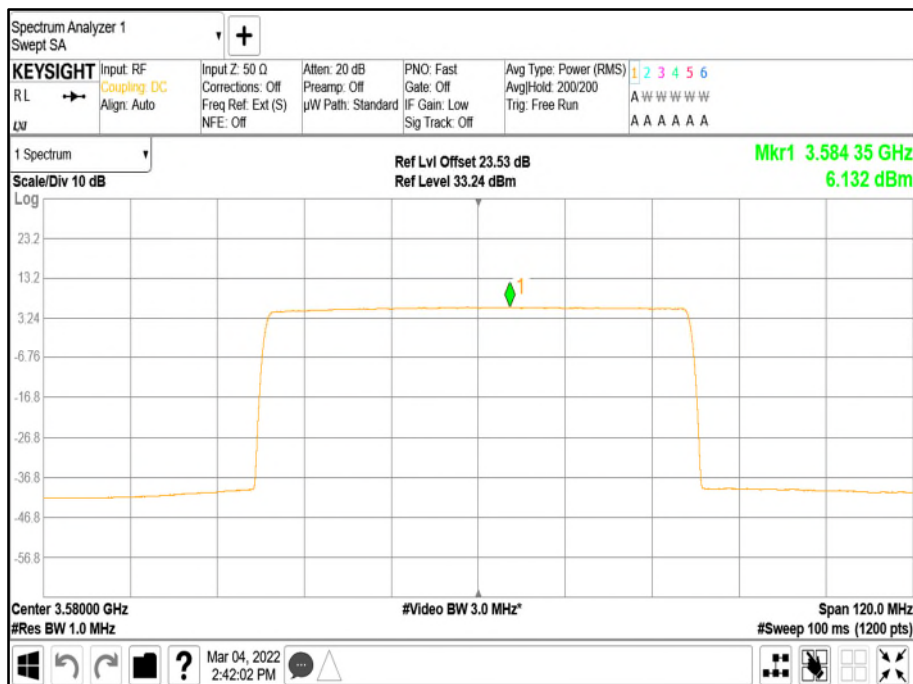
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 60.0 MHz - Channel Position B



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

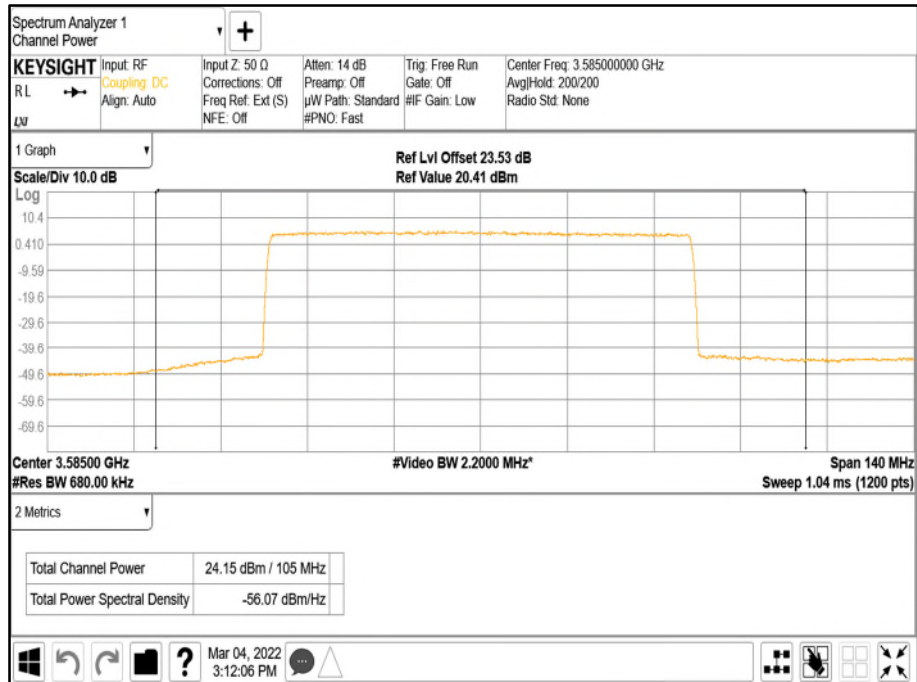


Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 60.0 MHz - Channel Position B





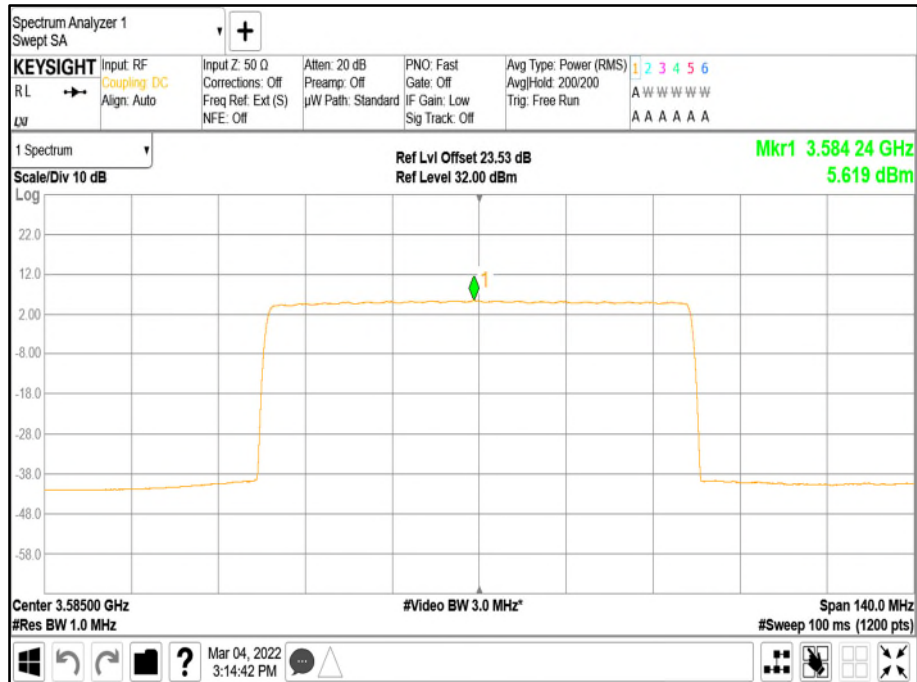
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 70.0 MHz - Channel Position B



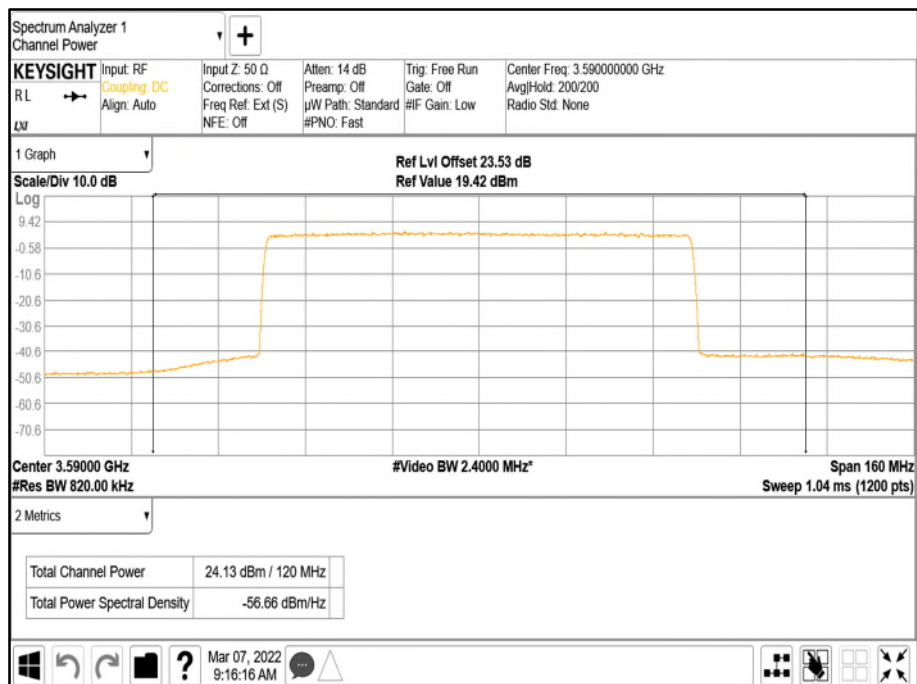
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 70.0 MHz - Channel Position B



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



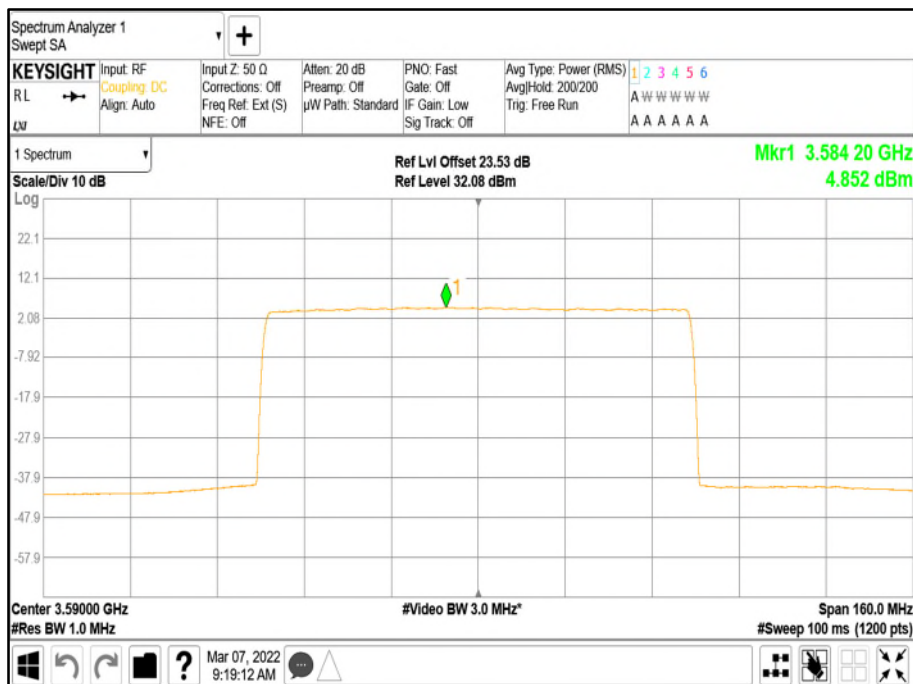
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 80.0 MHz - Channel Position B



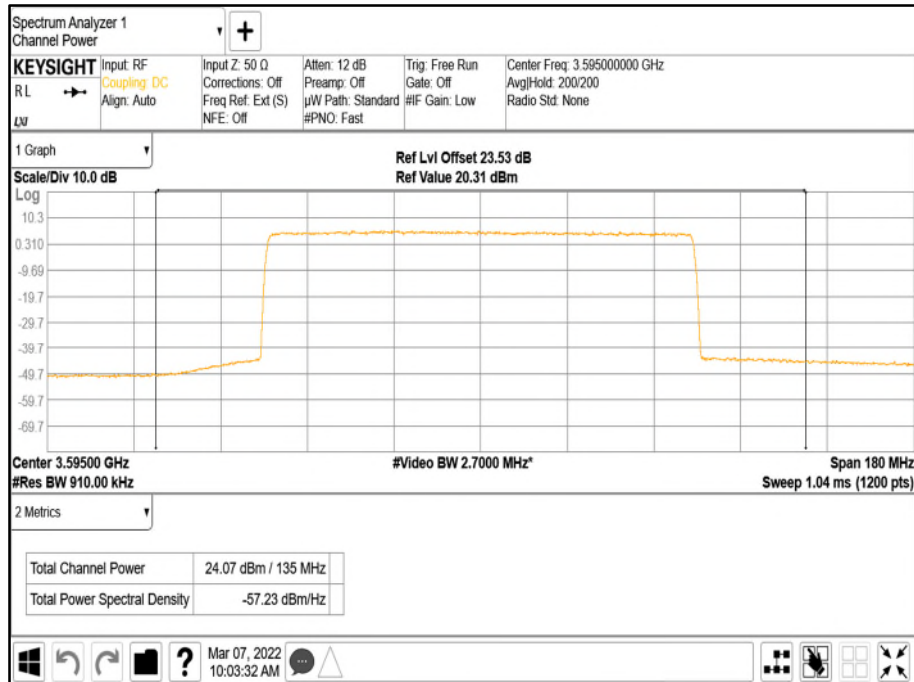
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 80.0 MHz - Channel Position B



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

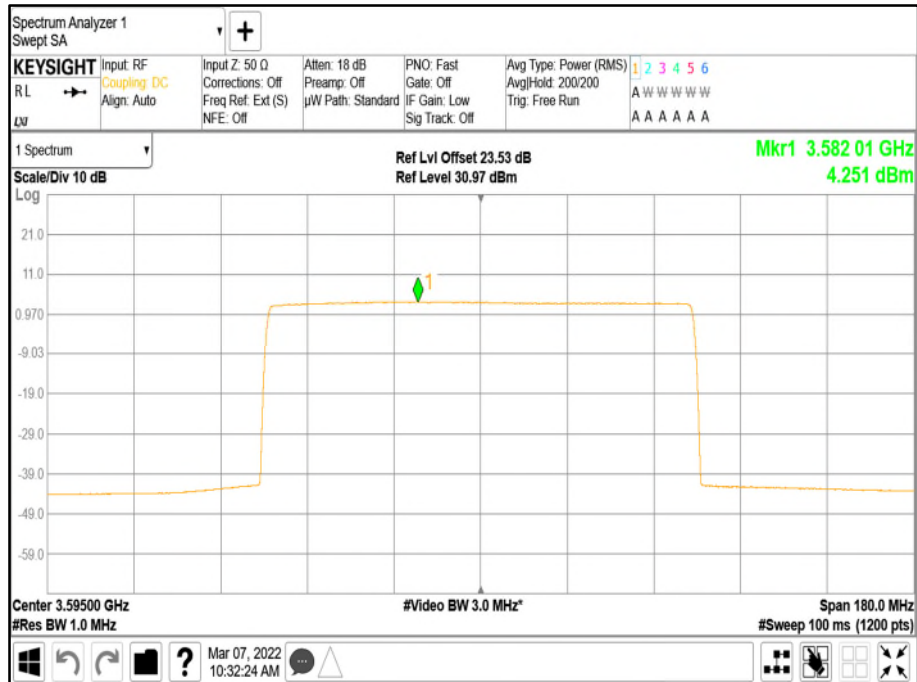


Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 90.0 MHz - Channel Position B

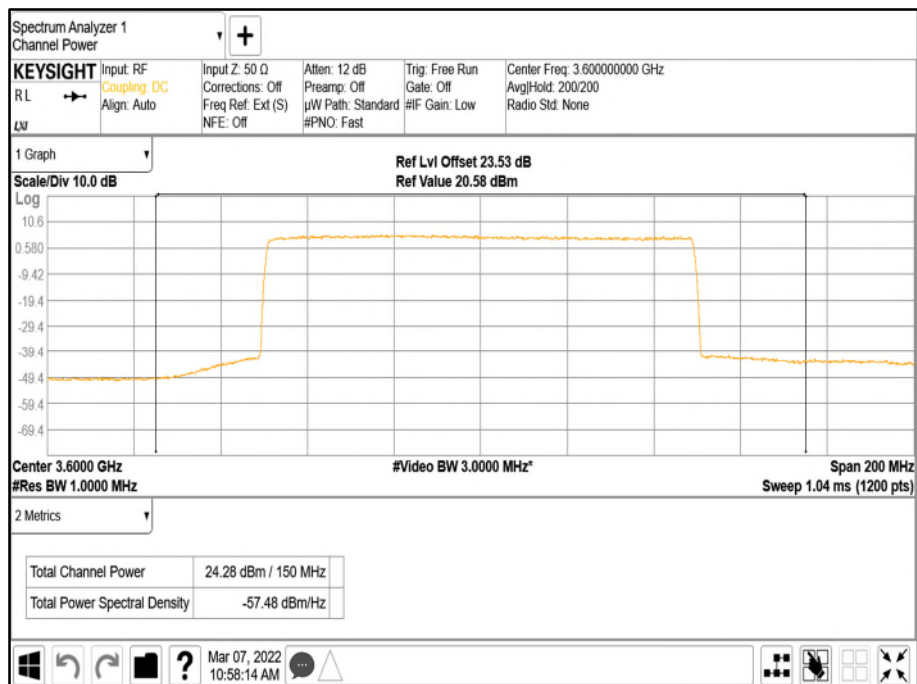




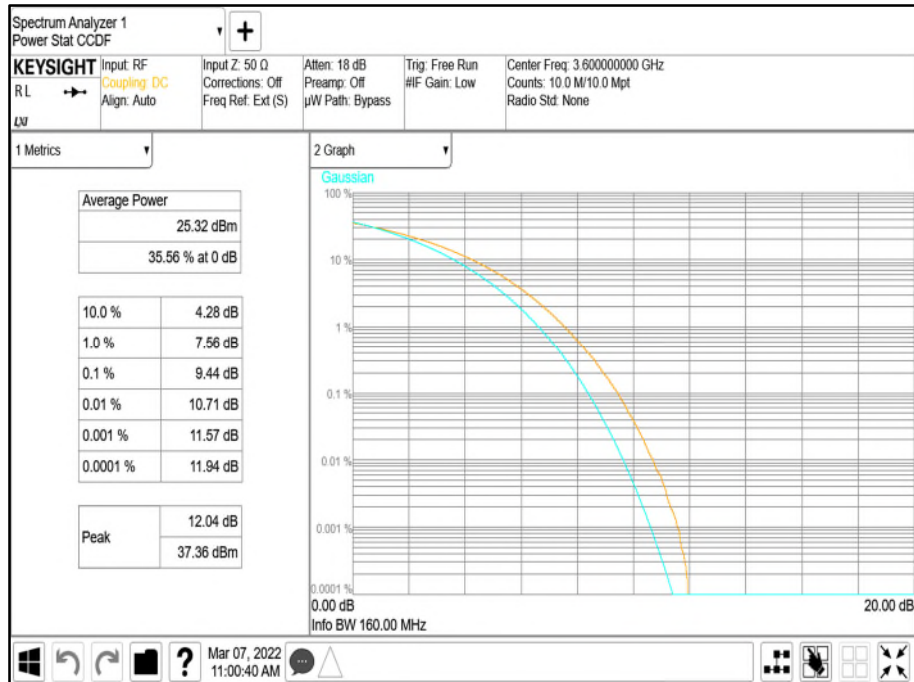
Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 90.0 MHz - Channel Position B



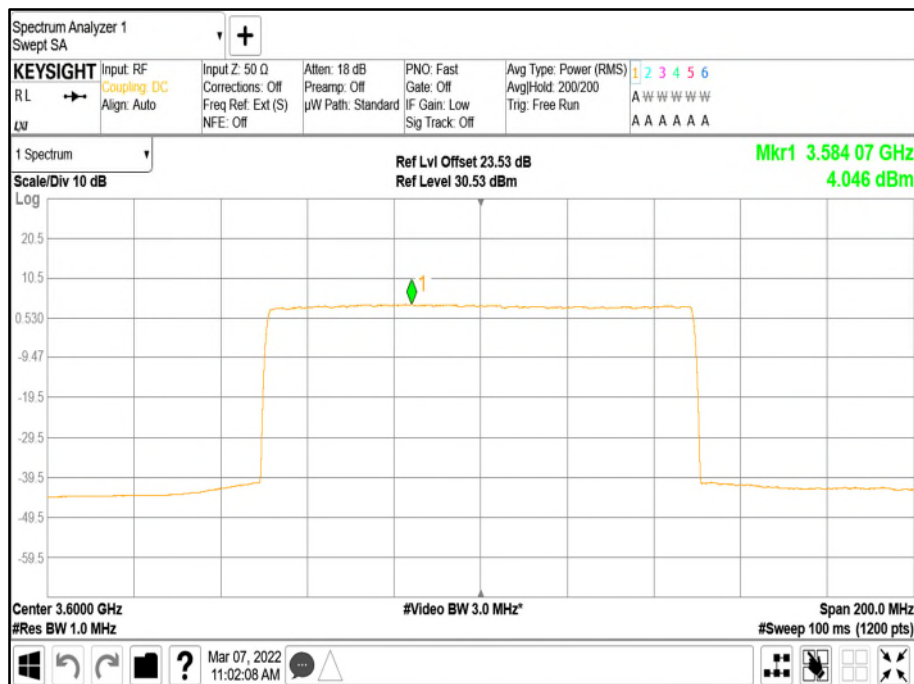
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 100.0 MHz - Channel Position B



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 (EIRP): 30dBm/10 MHz

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	PSD / Output Power		
			Channel Position M		
			M		
Antenna Port			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
5.29					
A	LTE: QPSK	10.0+10.0 MHz	19.73	16.72	22.01
B	LTE: QPSK	10.0+10.0 MHz	19.93	16.92	22.21
C	LTE: QPSK	10.0+10.0 MHz	20.12	17.11	22.40
D	LTE: QPSK	10.0+10.0 MHz	20.21	17.20	22.49
Total			26.02	23.01	28.30
A	LTE: QPSK	20.0+20.0 MHz	23.39	17.37	22.66
B	LTE: QPSK	20.0+20.0 MHz	23.98	17.96	23.25
C	LTE: QPSK	20.0+20.0 MHz	23.94	17.92	23.21
D	LTE: QPSK	20.0+20.0 MHz	24.02	18.00	23.29
Total			29.86	23.84	29.13
A	*LTE: QPSK	10.0+10.0 MHz	20.09	17.08	22.37
B	*LTE: QPSK	10.0+10.0 MHz	20.36	17.35	22.64
C	*LTE: QPSK	10.0+10.0 MHz	20.51	17.50	22.79
D	*LTE: QPSK	10.0+10.0 MHz	20.54	17.53	22.82
Total			26.40	23.39	28.68
A	*LTE: QPSK	20.0+20.0 MHz	23.88	17.86	23.15
B	*LTE: QPSK	20.0+20.0 MHz	24.23	18.21	23.50
C	*LTE: QPSK	20.0+20.0 MHz	24.14	18.12	23.41
D	*LTE: QPSK	20.0+20.0 MHz	24.28	18.26	23.55
Total			30.16	24.14	29.43
A	NR: QPSK	20.0+20.0 MHz	23.07	17.05	22.34
B	NR: QPSK	20.0+20.0 MHz	23.04	17.02	22.31
C	NR: QPSK	20.0+20.0 MHz	23.27	17.25	22.54
D	NR: QPSK	20.0+20.0 MHz	23.35	17.33	22.62
Total			29.21	23.18	28.47
A	NR: QPSK	70.0+70.0 MHz	25.25	13.79	19.08
B	NR: QPSK	70.0+70.0 MHz	25.37	13.91	19.20
C	NR: QPSK	70.0+70.0 MHz	25.63	14.17	19.46
D	NR: QPSK	70.0+70.0 MHz	25.57	14.11	19.40
Total			31.48	20.02	25.31
A	*NR: QPSK	20.0+20.0 MHz	23.39	17.37	22.66
B	*NR: QPSK	20.0+20.0 MHz	23.38	17.36	22.65
C	*NR: QPSK	20.0+20.0 MHz	23.53	17.51	22.80
D	*NR: QPSK	20.0+20.0 MHz	23.41	17.39	22.68
Total			29.45	23.43	28.72
A	*NR: QPSK	70.0+70.0 MHz	25.39	13.93	19.22
B	*NR: QPSK	70.0+70.0 MHz	25.39	13.93	19.22
C	*NR: QPSK	70.0+70.0 MHz	25.66	14.20	19.49
D	*NR: QPSK	70.0+70.0 MHz	25.74	14.28	19.57
Total			31.57	20.11	25.40
A	NR+LTE: QPSK	20.0+10.0 MHz	22.14	17.37	22.66
B	NR+LTE: QPSK	20.0+10.0 MHz	21.78	17.01	22.30
C	NR+LTE: QPSK	20.0+10.0 MHz	21.96	17.19	22.48
D	NR+LTE: QPSK	20.0+10.0 MHz	22.25	17.48	22.77
Total			28.06	23.29	28.58
A	*NR+LTE: QPSK	20.0+10.0 MHz	21.85	17.08	22.37
B	*NR+LTE: QPSK	20.0+10.0 MHz	22.32	17.55	22.84
C	*NR+LTE: QPSK	20.0+10.0 MHz	22.54	17.77	23.06
D	*NR+LTE: QPSK	20.0+10.0 MHz	22.27	17.50	22.79
Total			28.27	23.50	28.79

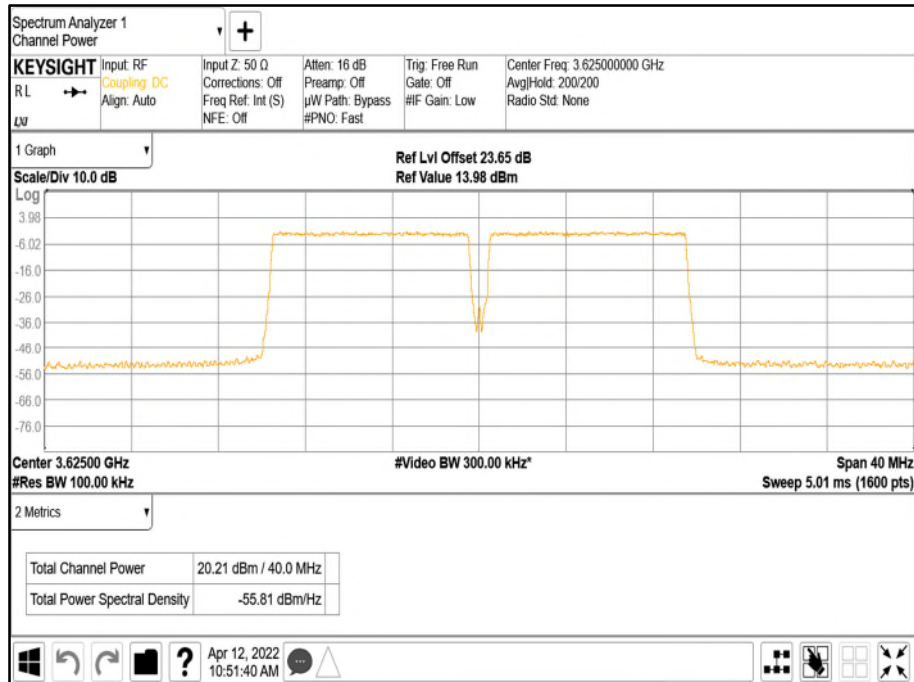


Remarks

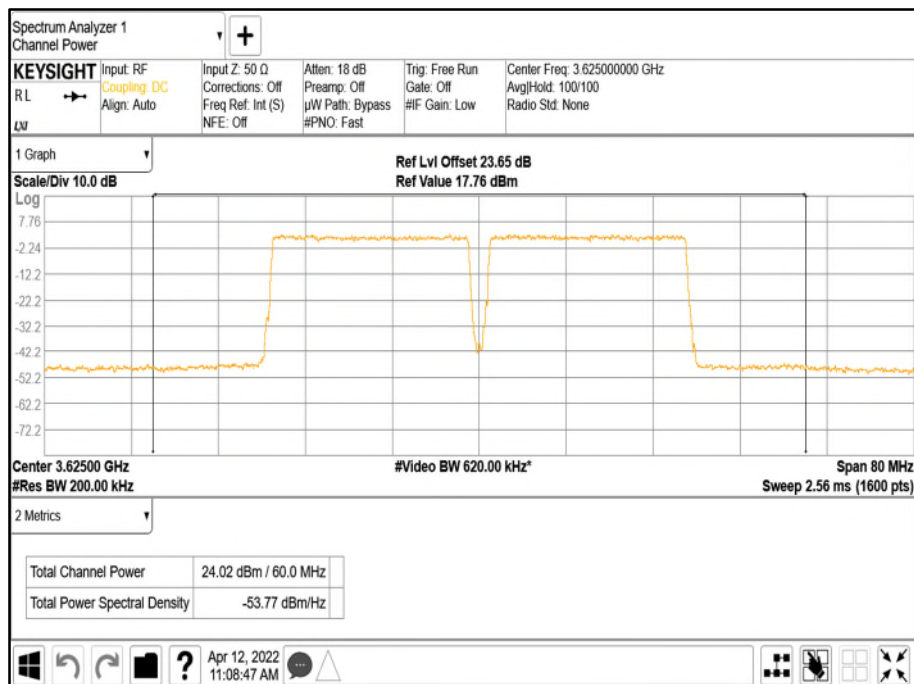
1. The table results are measured at all antenna ports.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels for both contiguous and non-contiguous (NC) operation are available on request.
4. * = non-contiguous configuration.



Antenna Port D Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position M

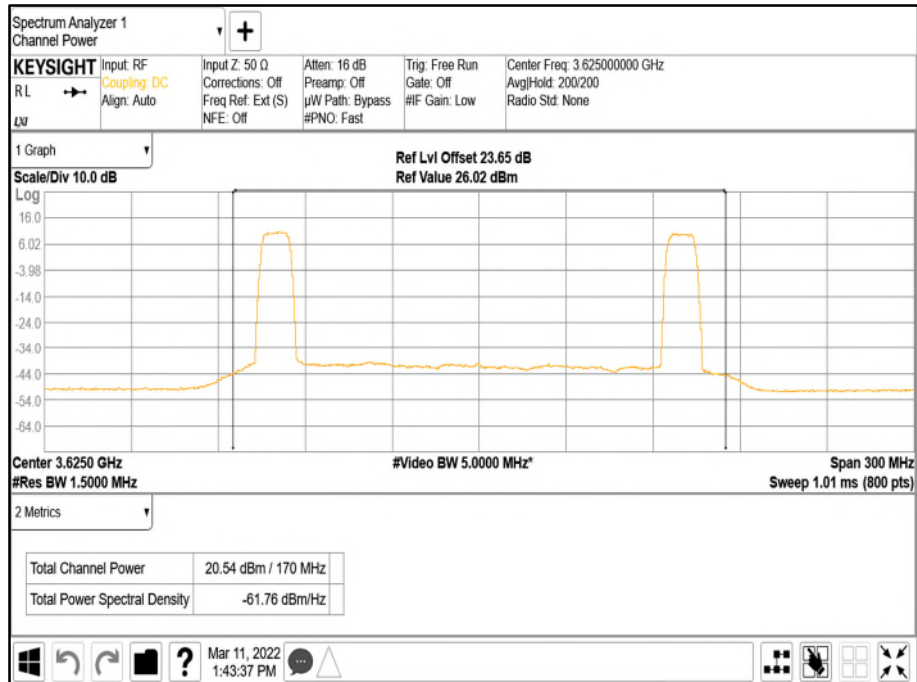


Antenna Port D Carrier Power - Modulation LTE: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position M

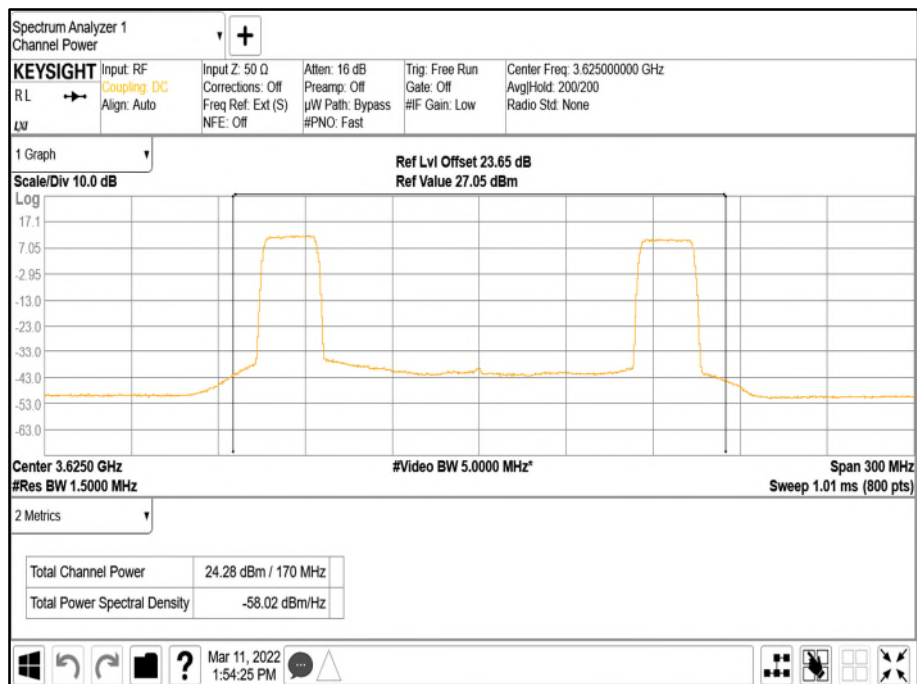




Antenna Port D Carrier Power - Modulation *LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position M

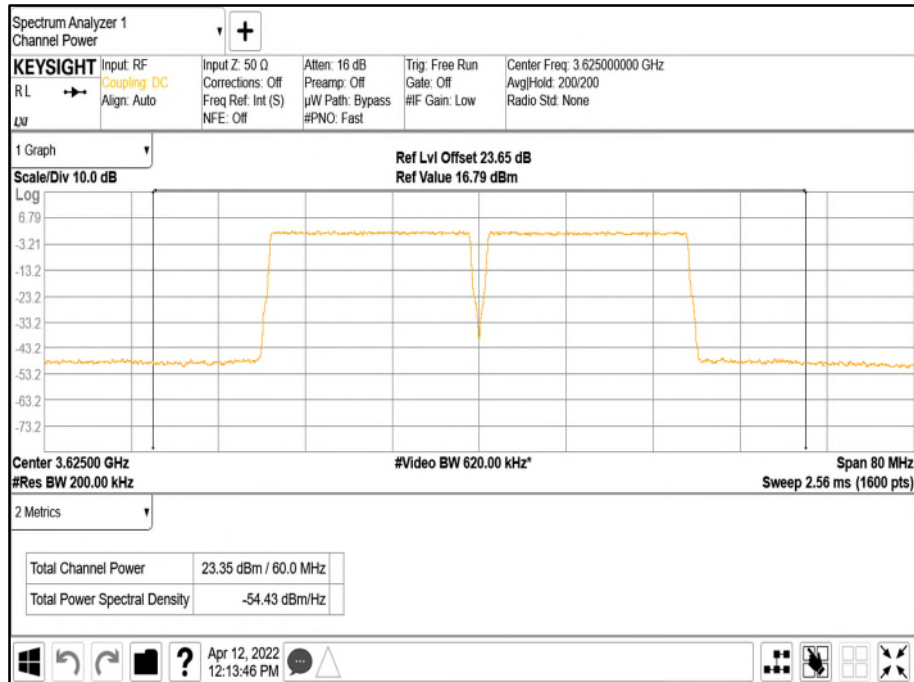


Antenna Port D Carrier Power - Modulation *LTE: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position M

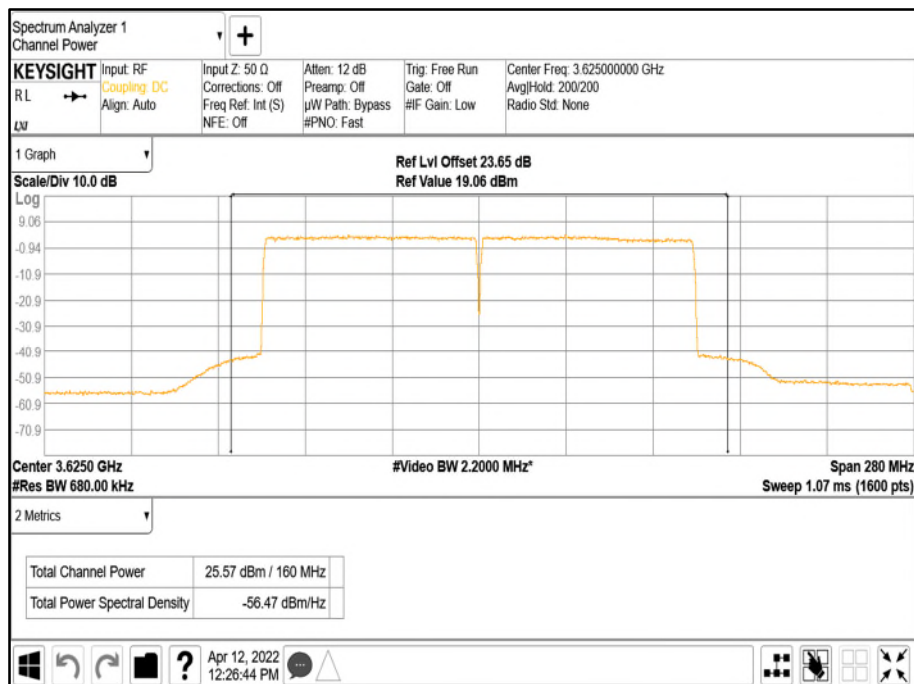




Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position M

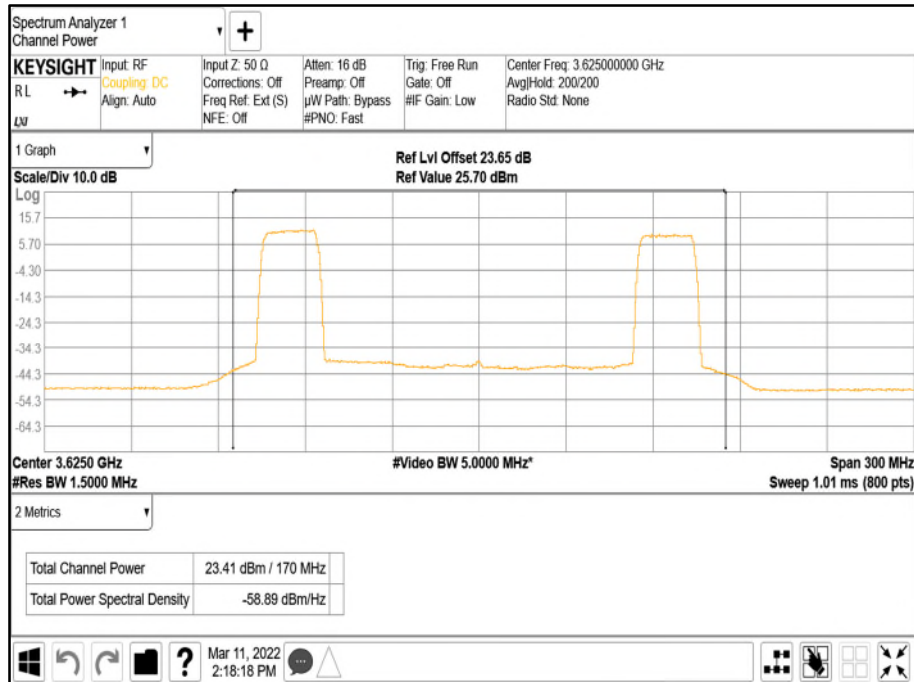


Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 70.0+70.0 MHz - Channel Position M

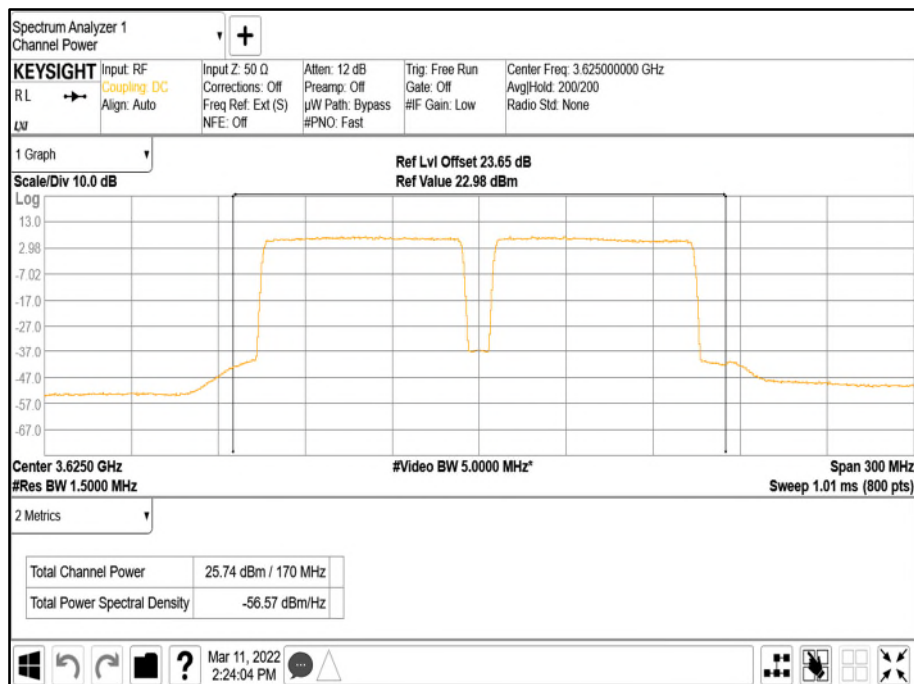




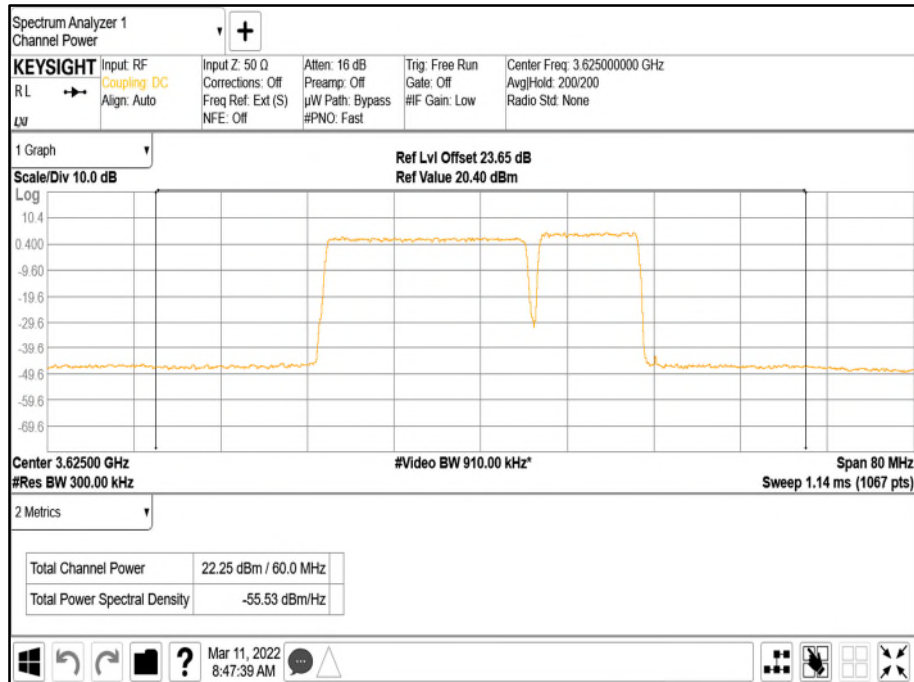
Antenna Port D Carrier Power - Modulation *NR: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position M



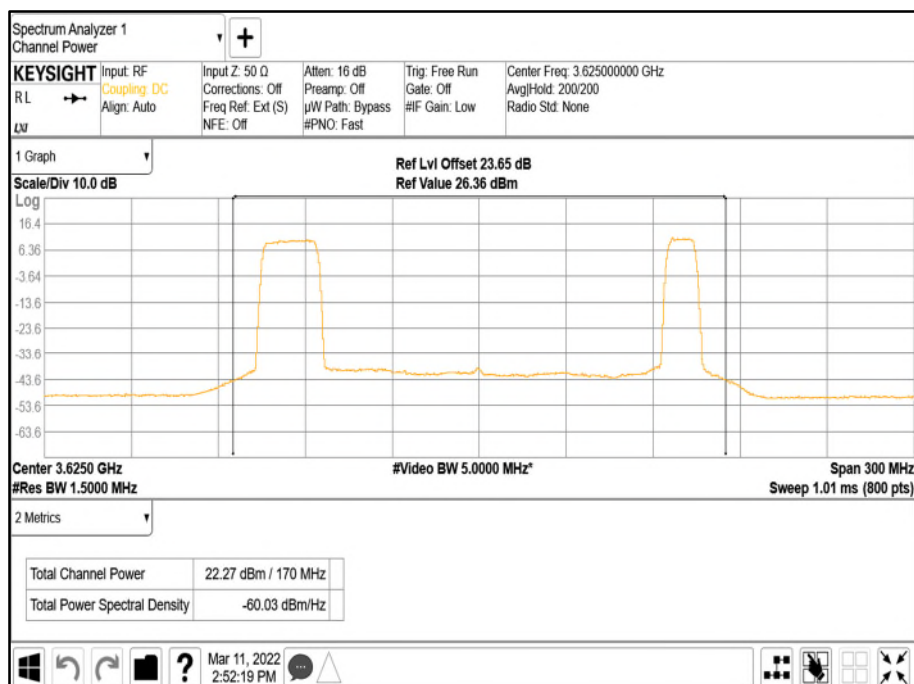
Antenna Port D Carrier Power - Modulation *NR: QPSK - Carrier Bandwidth 70.0+70.0 MHz - Channel Position M



Antenna Port D Carrier Power - Modulation NR+LTE: QPSK - Carrier Bandwidth 20.0+10.0 MHz - Channel Position M



Antenna Port D Carrier Power - Modulation *NR+LTE: QPSK - Carrier Bandwidth 20.0+10.0 MHz - Channel Position M





Configuration C

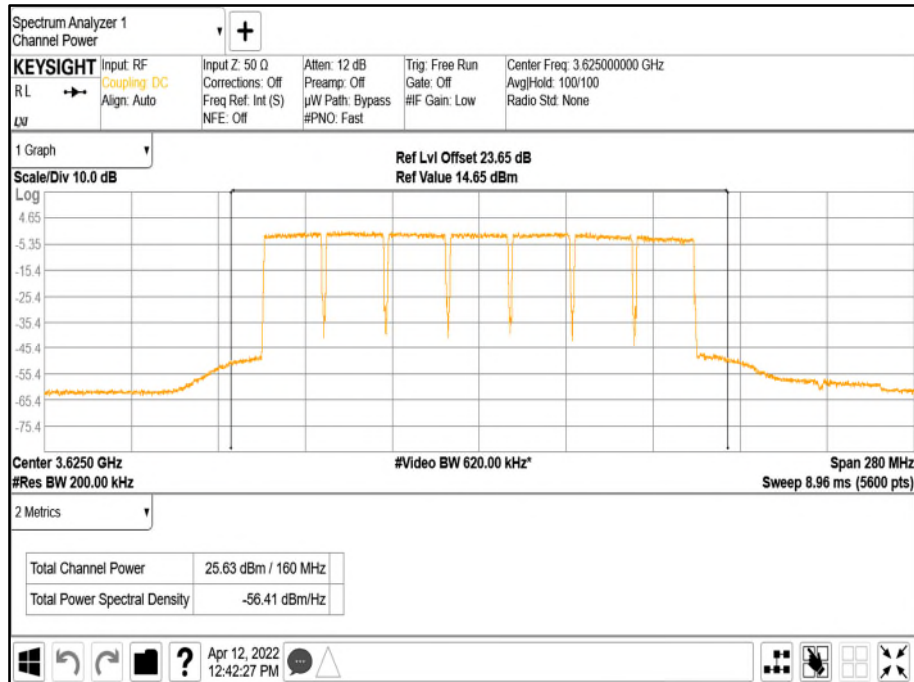
Maximum Output Power (EIRP): 30dBm/10 MHz

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	PSD / Output Power		
5.29			Channel Position M		
Antenna Port			Average Power		
			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	NR: QPSK	20+20+20+20+20+20+20 MHz	25.20	13.74	19.03
B	NR: QPSK	20+20+20+20+20+20+20 MHz	25.46	14.00	19.29
C	NR: QPSK	20+20+20+20+20+20+20 MHz	25.63	14.17	19.46
D	NR: QPSK	20+20+20+20+20+20+20 MHz	25.57	14.11	19.40
Total			31.49	20.03	25.32
A	*NR: QPSK	20+20+20+20+20+20+20 MHz	25.45	13.99	19.28
B	*NR: QPSK	20+20+20+20+20+20+20 MHz	25.62	14.16	19.45
C	*NR: QPSK	20+20+20+20+20+20+20 MHz	25.77	14.31	19.60
D	*NR: QPSK	20+20+20+20+20+20+20 MHz	25.45	13.99	19.28
Total			31.60	20.13	25.42

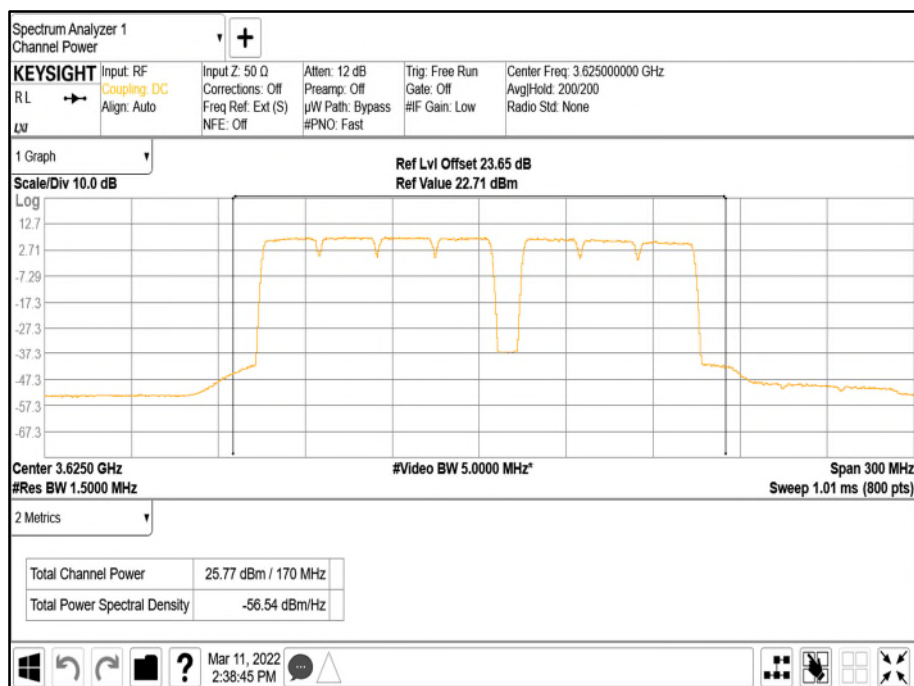
Remarks

1. The table results are measured at all antenna ports.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels for both contiguous and non-contiguous (*NC) operation are available on request.

Antenna Port D Carrier Power - Modulation NR: QPSK - Carrier Bandwidth
20+20+20+20+20+20+20 MHz - Channel Position M



Antenna Port D Carrier Power - Modulation *NR: QPSK - Carrier Bandwidth
20+20+20+20+20+20+20 MHz - Channel Position M





Configuration D

Maximum Output Power (EIRP): 30dBm/10 MHz

Antenna Gain (dBi)	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / PSD / Output Power		
5.29			Channel Position M		
Antenna Port			Average Power		
			dBm	dBm / 10 MHz	EIRP dBm/10 MHz
A	LTE: QPSK	10+10+10+10+10+10+10+10+10+10+10 MHz	25.16	14.37	19.66
B	LTE: QPSK	10+10+10+10+10+10+10+10+10+10+10 MHz	25.32	14.53	19.82
C	LTE: QPSK	10+10+10+10+10+10+10+10+10+10+10 MHz	25.36	14.57	19.86
D	LTE: QPSK	10+10+10+10+10+10+10+10+10+10+10 MHz	25.44	14.65	19.94
Total			31.34	20.55	25.84
A	NR(3)+LTE(9): QPSK	20+20+20+10+10+10+10+10+10+10+10 MHz	24.36	12.60	17.89
B	NR(3)+LTE(9): QPSK	20+20+20+10+10+10+10+10+10+10+10 MHz	24.90	13.14	18.43
C	NR(3)+LTE(9): QPSK	20+20+20+10+10+10+10+10+10+10+10 MHz	24.92	13.16	18.45
D	NR(3)+LTE(9): QPSK	20+20+20+10+10+10+10+10+10+10+10 MHz	24.82	13.06	18.35
Total			30.78	19.02	24.31
A	*NR(2)+LTE(10): QPSK	20+20+10+10+10+10+10+10+10+10+10 MHz	24.54	13.08	18.37
B	*NR(2)+LTE(10): QPSK	20+20+10+10+10+10+10+10+10+10+10 MHz	24.64	13.18	18.47
C	*NR(2)+LTE(10): QPSK	20+20+10+10+10+10+10+10+10+10+10 MHz	24.37	12.91	18.20
D	*NR(2)+LTE(10): QPSK	20+20+10+10+10+10+10+10+10+10+10 MHz	24.66	13.20	18.49
Total			30.57	19.11	24.40

Remarks

1. The table results are measured at all antenna ports.
2. The plot results represent typical radio performance across all channels.
3. Plot data performance for all transmitter ports and channels for both contiguous and non-contiguous (*NC) operation are available on request.
4. * = non-contiguous configuration.



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(3)
FCC CFR 47 Part 2, Clause 2.1049

2.2.2 Date of Test and Modification State

17-March-2022 - Modification State 0
28-Feb 2023 – Radiated PSD measurements – 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	24.6°C
Relative Humidity	30.8%

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.



2.2.6 Test Results

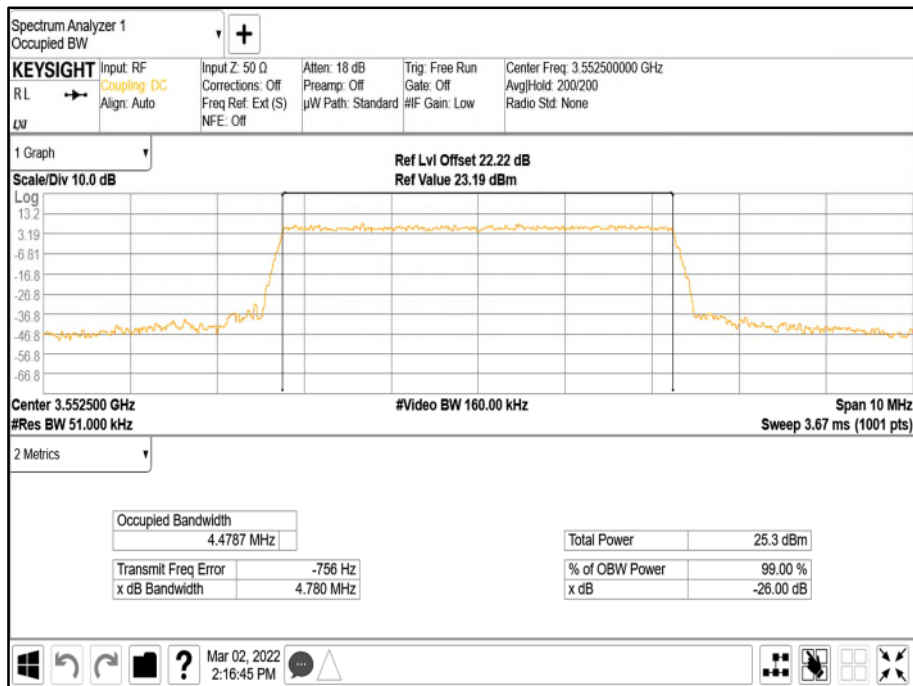
Configuration A

Modulation	Carrier Bandwidth	Result (MHz)	
		Channel Bandwidth	
		Occupied Bandwidth	-26 dB Bandwidth
LTE: QPSK	LTE: 5.0 MHz	4.48	4.78
LTE: QPSK	LTE: 10.0 MHz	8.95	9.62
LTE: QPSK	LTE: 20.0 MHz	17.86	18.88
NR: QPSK	NR: 20.0 MHz	18.25	19.49
NR: QPSK	NR: 30.0 MHz	27.89	29.53
NR: QPSK	NR: 40.0 MHz	37.80	39.68
NR: QPSK	NR: 50.0 MHz	47.36	49.49
NR: QPSK	NR: 60.0 MHz	57.68	59.74
NR: QPSK	NR: 70.0 MHz	67.22	69.61
NR: QPSK	NR: 80.0 MHz	77.32	79.95
NR: QPSK	NR: 90.0 MHz	87.28	90.17
NR: QPSK	NR: 100.0 MHz	97.19	100.60

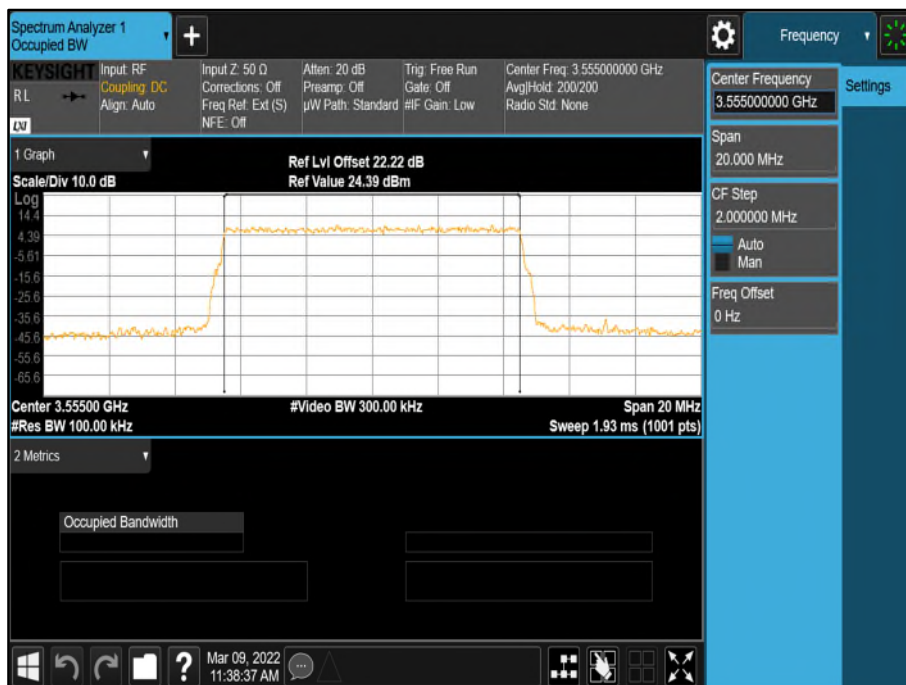
Remarks

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

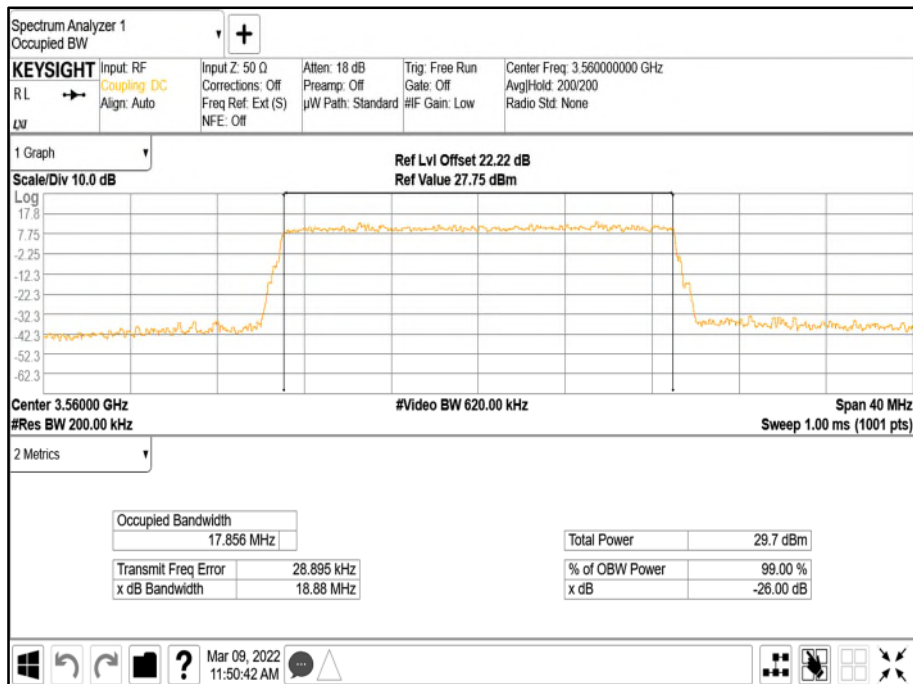
Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position B



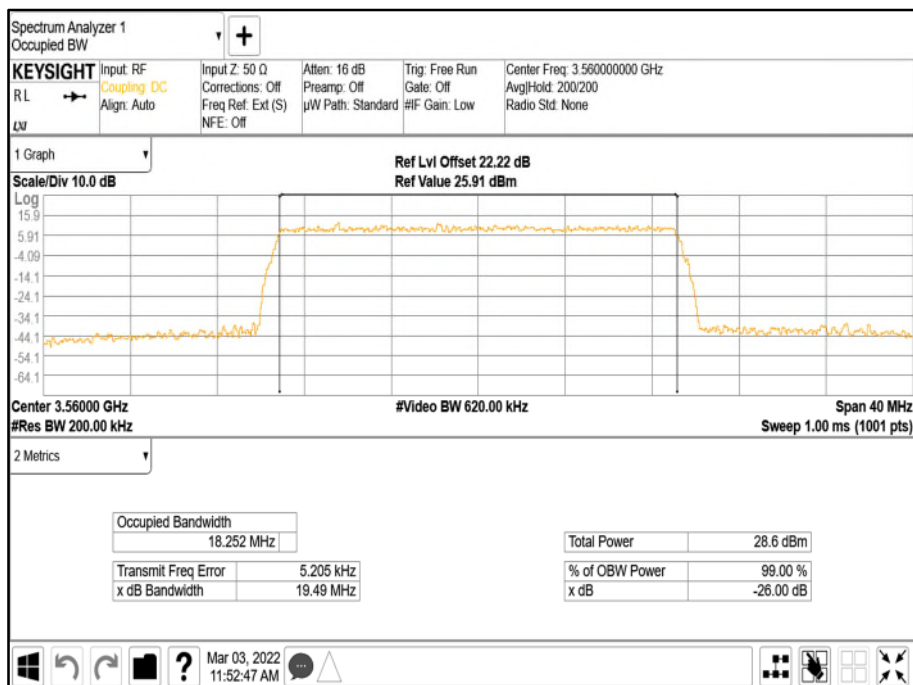
Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position B



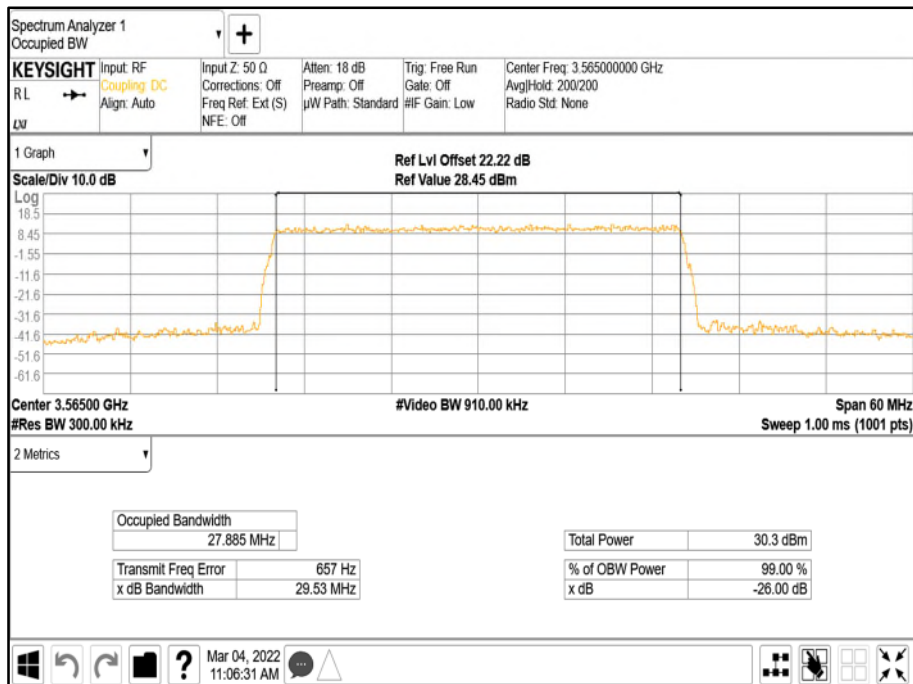
Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position B



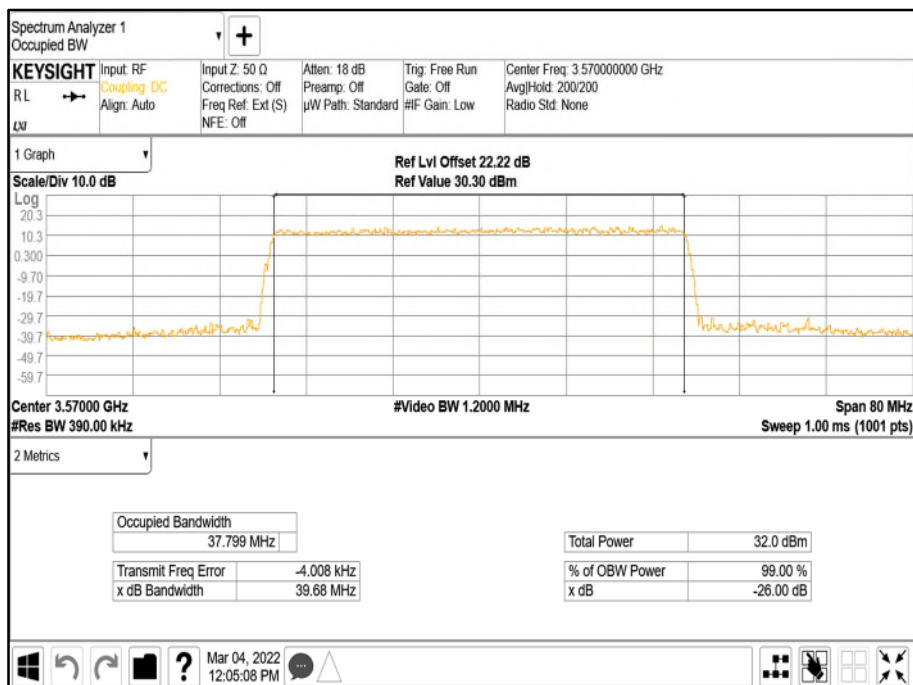
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 20.0 MHz - Channel Position B



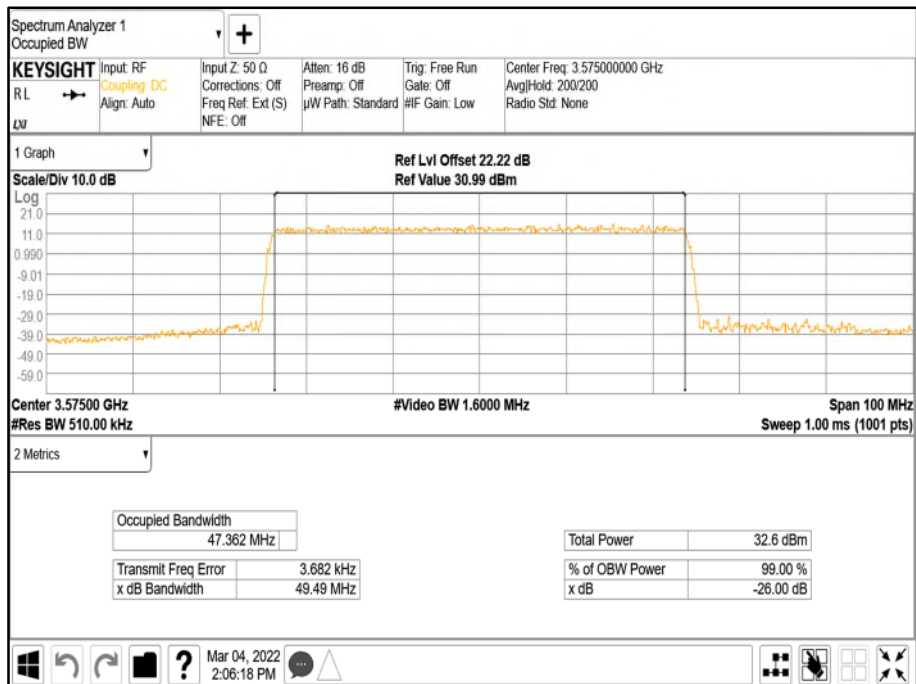
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 30.0 MHz - Channel Position B



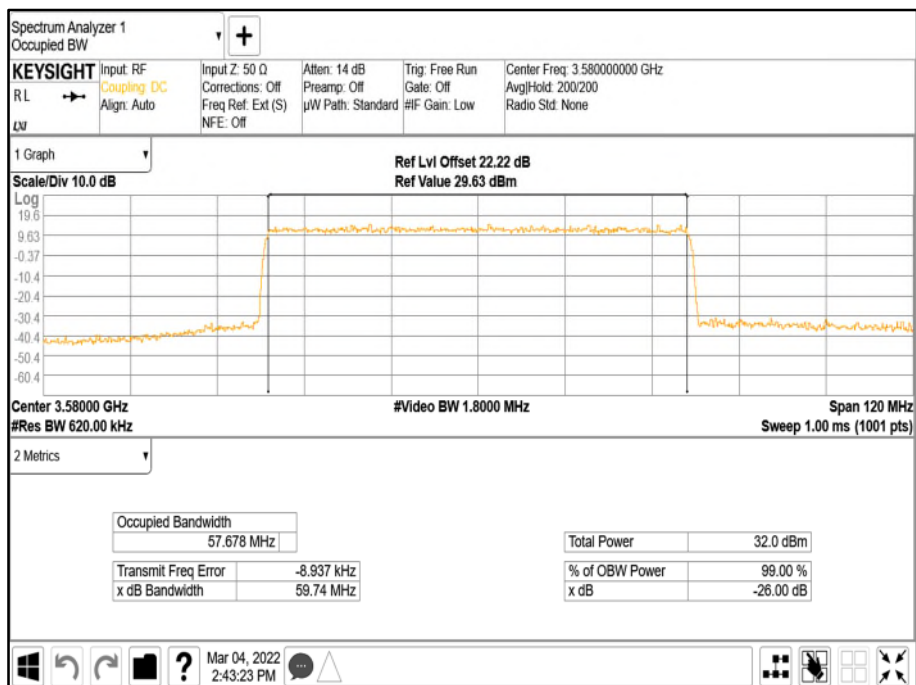
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 40.0 MHz - Channel Position B



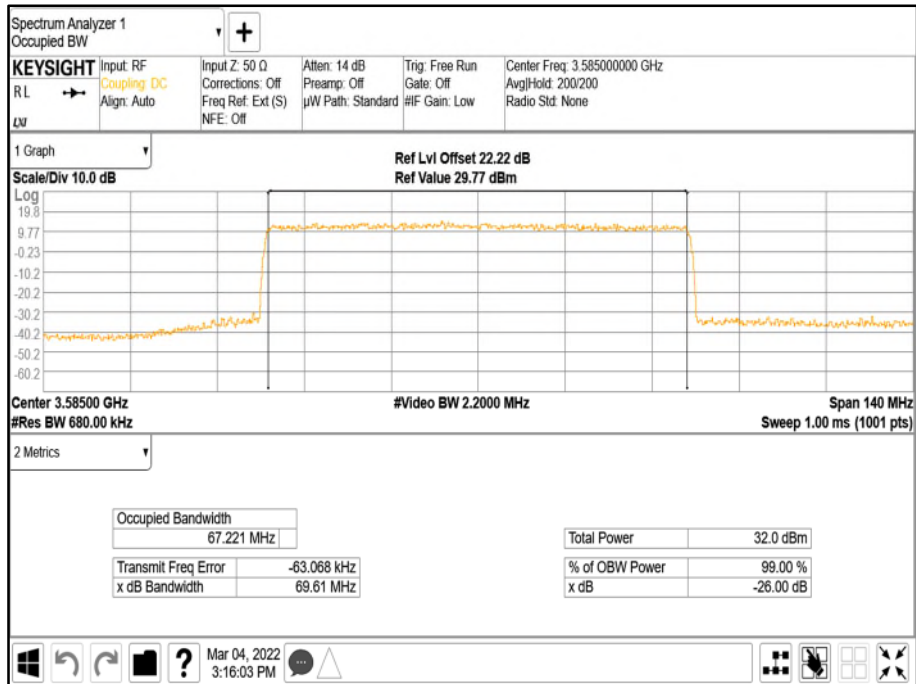
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position B



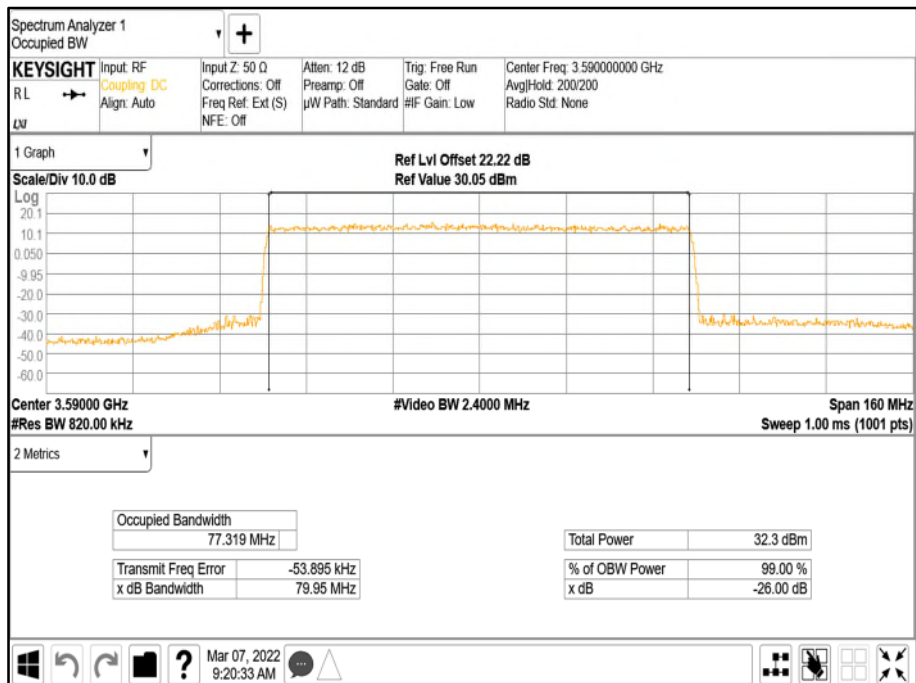
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 60.0 MHz - Channel Position B



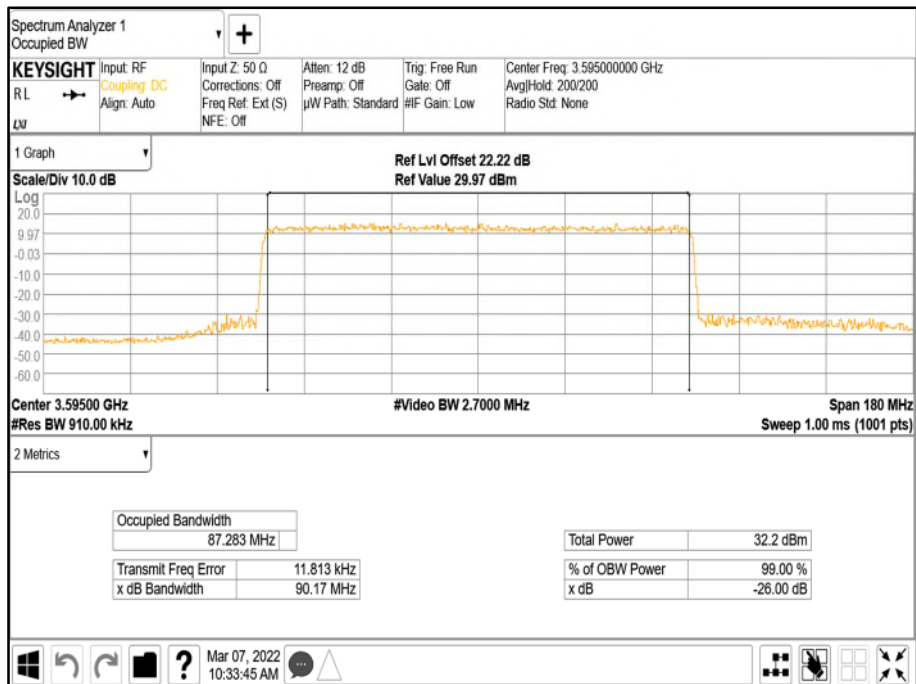
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 70.0 MHz - Channel Position B



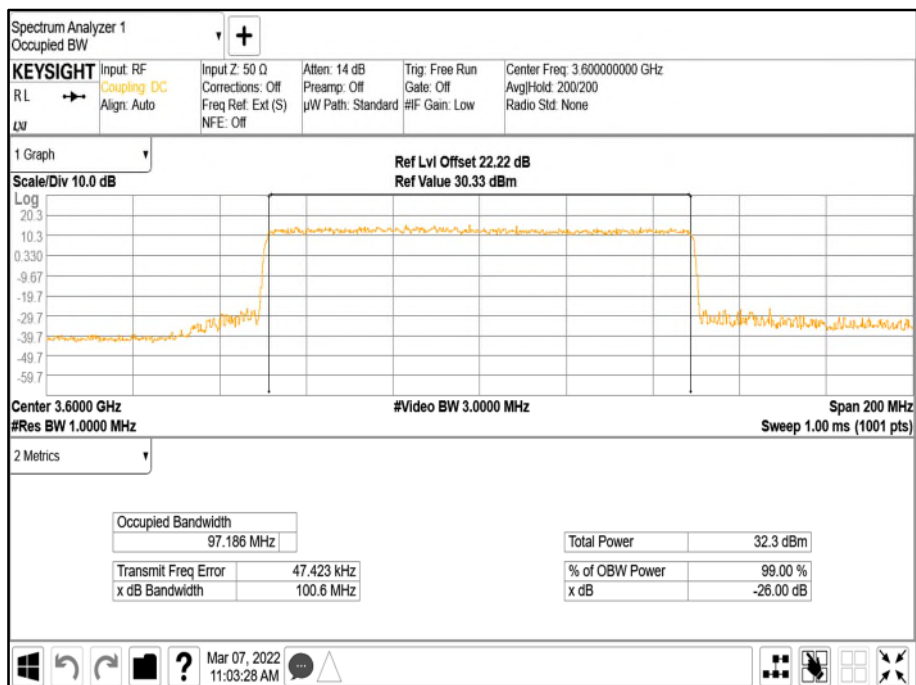
Antenna A - Modulation NR: QPSK - Carrier Bandwidth NR: 80.0 MHz - Channel Position B



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



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





2.3 BAND EDGE & ADDITIONAL PROTECTION LEVELS

2.3.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(3)
FCC CFR 47 Part 2, Clause 2.1051

2.3.2 Date of Test and Modification State

17-March-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	24.6°C
Relative Humidity	30.8%

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 $10 * \log(N)$, where N is equal to the number of MIMO antenna ports.

For single port, the limit was calculated as being $-13 \text{ dBm} - 10 * \log(4) = -19 \text{ dBm}$.

Remarks

1. Bandedge data was captured from the transmit port with maximum measured power.
2. Worst case bandedge data presented.
3. The limit lines and frequency lines are adjusted / integrated to allow for verification of the unwanted emission requirement of -13 dBm/MHz from 0-10 MHz of the Band edge and -25 dBm/MHz from 10-20 MHz of the Band Edge as per the requirement of CFR Part 96, Subpart E, 96.41(e) considering a 4-port transmitter.

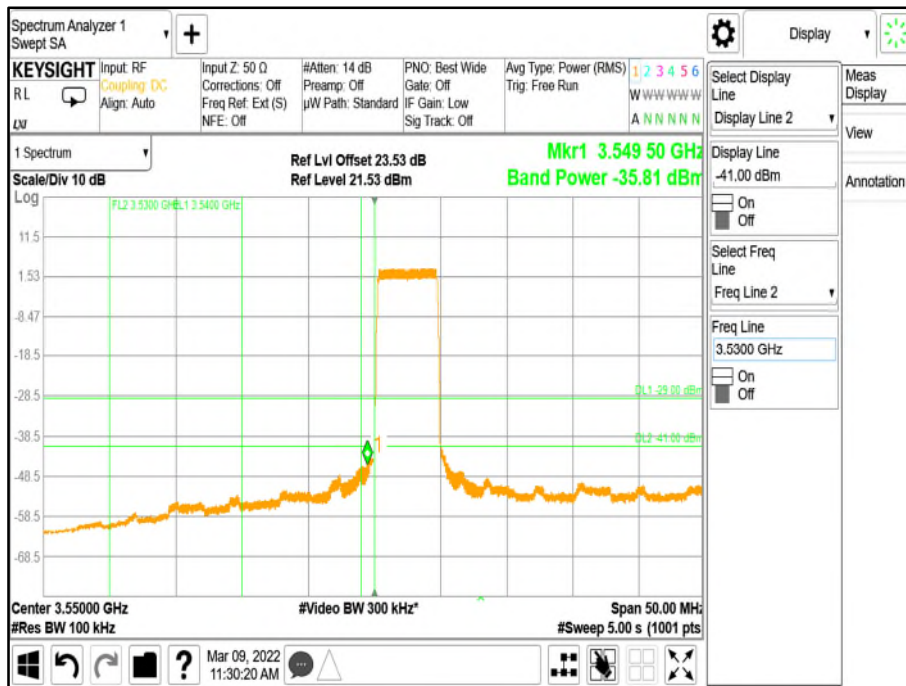


2.3.6 Test Results

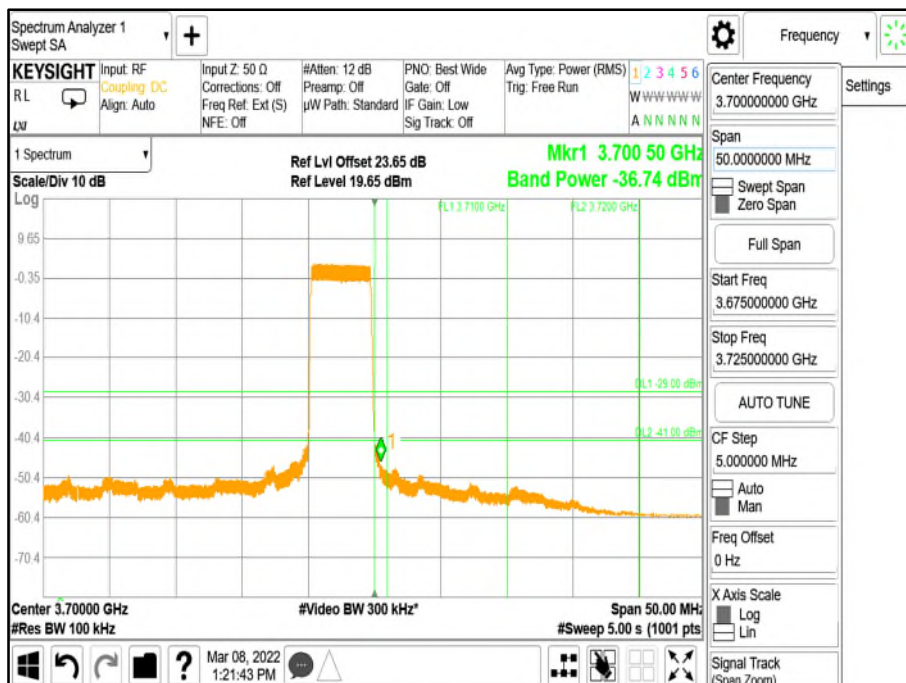
Configuration A

Antenna Port A	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	LTE: QPSK	LTE: 5.0 MHz	3,555.0	3,695.0
A	LTE: QPSK	LTE: 10.0 MHz	3,557.5	3,692.5
A	LTE: QPSK	LTE: 20.0 MHz	3,560.0	3,690.0
A	NR: QPSK	NR: 20.0 MHz	3,560.0	3,690.0
A	NR: QPSK	NR: 30.0 MHz	3,565.0	3,685.0
A	NR: QPSK	NR: 40.0 MHz	3,570.0	3,680.0
A	NR: QPSK	NR: 50.0 MHz	3,575.0	3,675.0
A	NR: QPSK	NR: 60.0 MHz	3,580.0	3,670.0
A	NR: QPSK	NR: 70.0 MHz	3,585.0	3,665.0
A	NR: QPSK	NR: 80.0 MHz	3,590.0	3,660.0
A	NR: QPSK	NR: 90.0 MHz	3,595.0	3,655.0
A	NR: QPSK	NR: 100.0 MHz	3,600.0	3,650.0

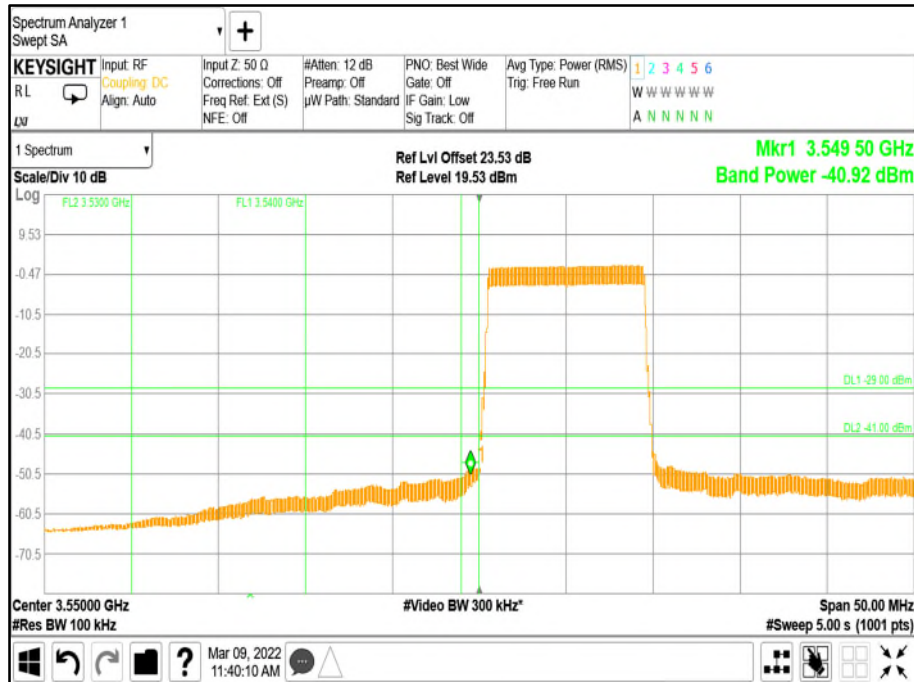
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position B



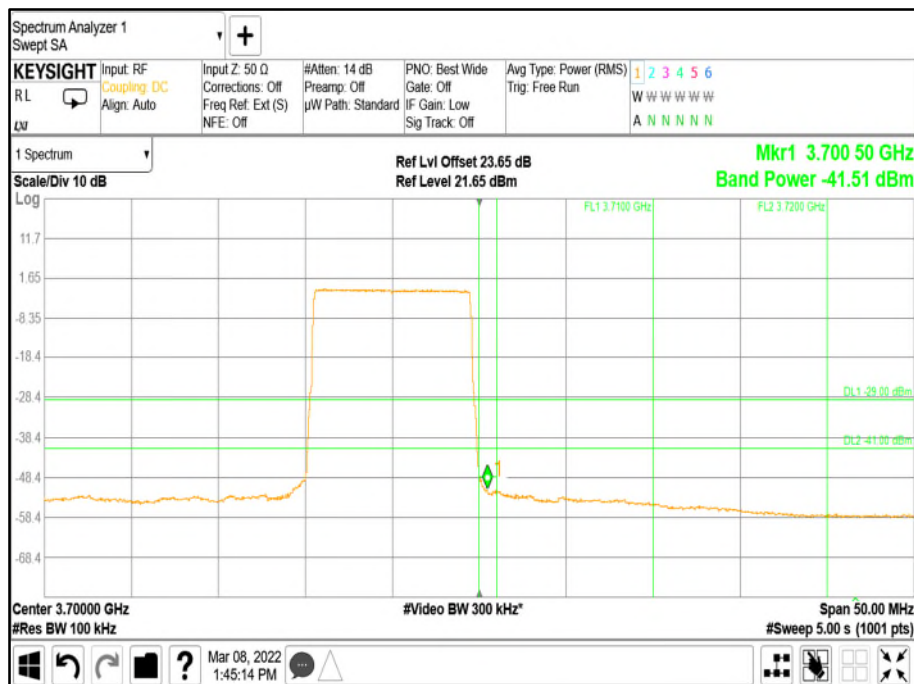
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5.0 MHz - Channel Position T



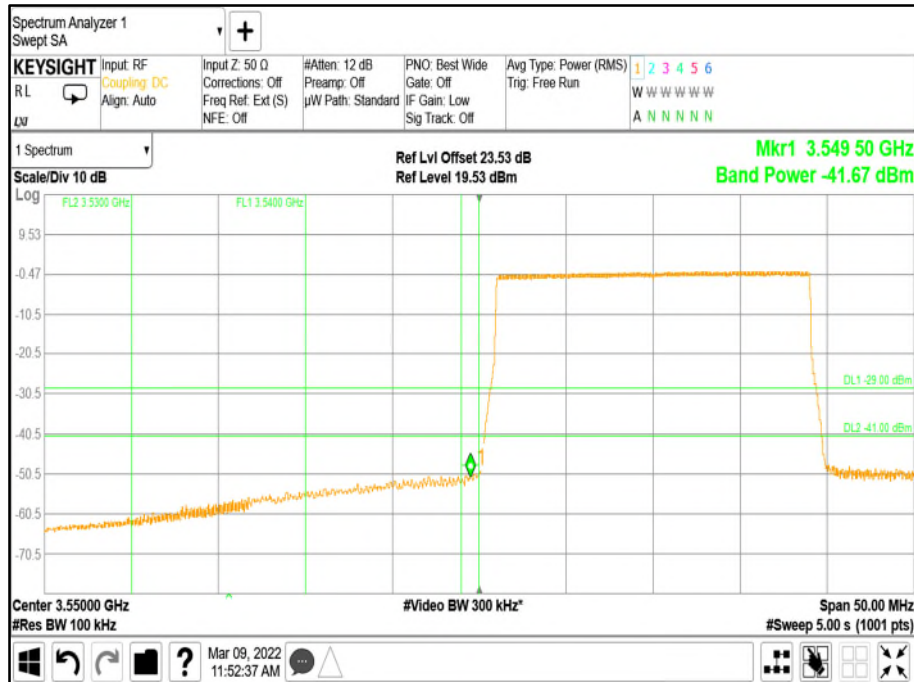
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position B



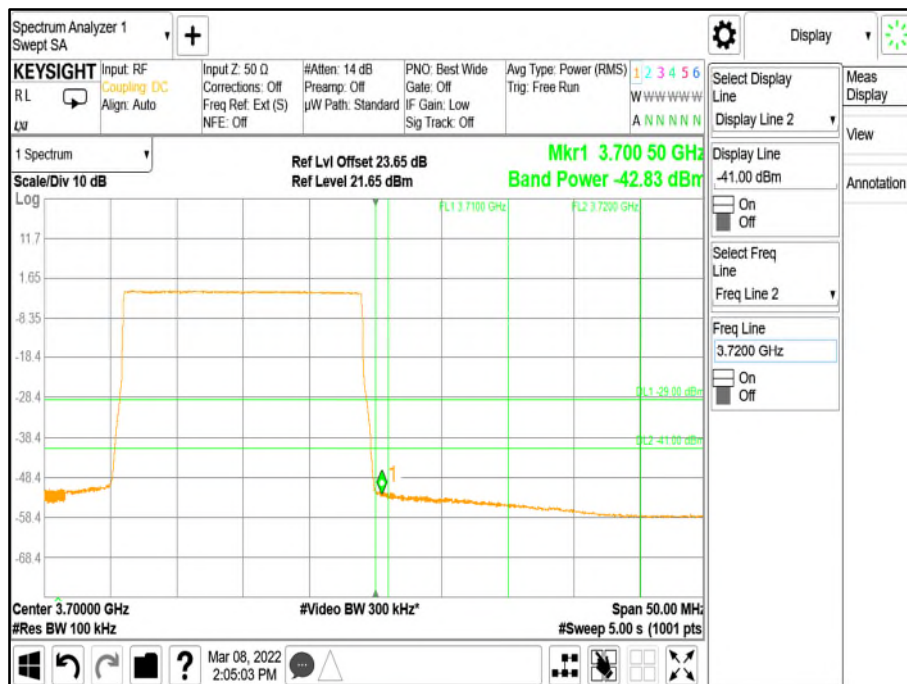
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 10.0 MHz - Channel Position T



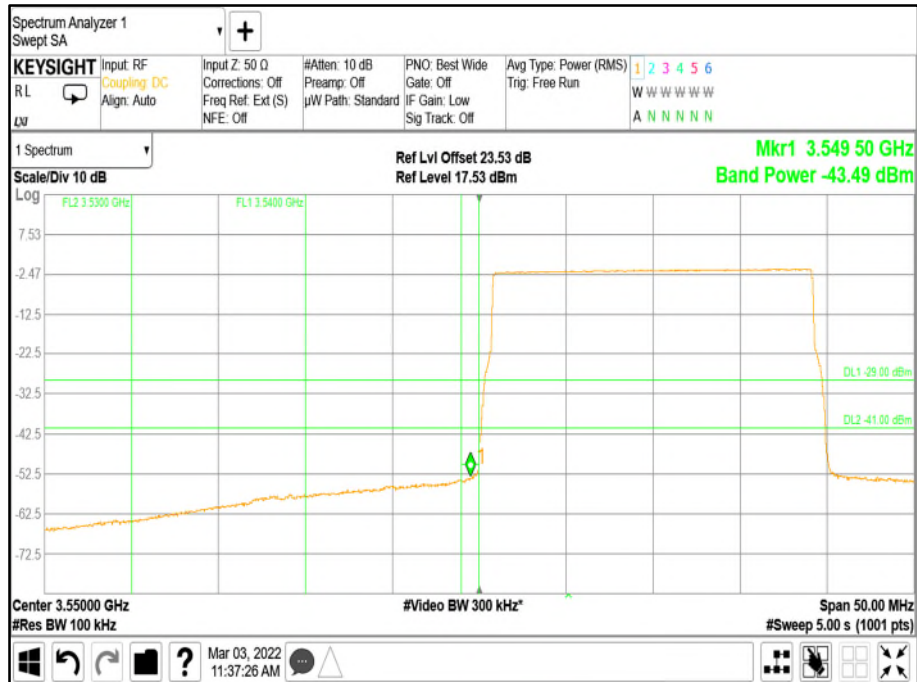
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position B



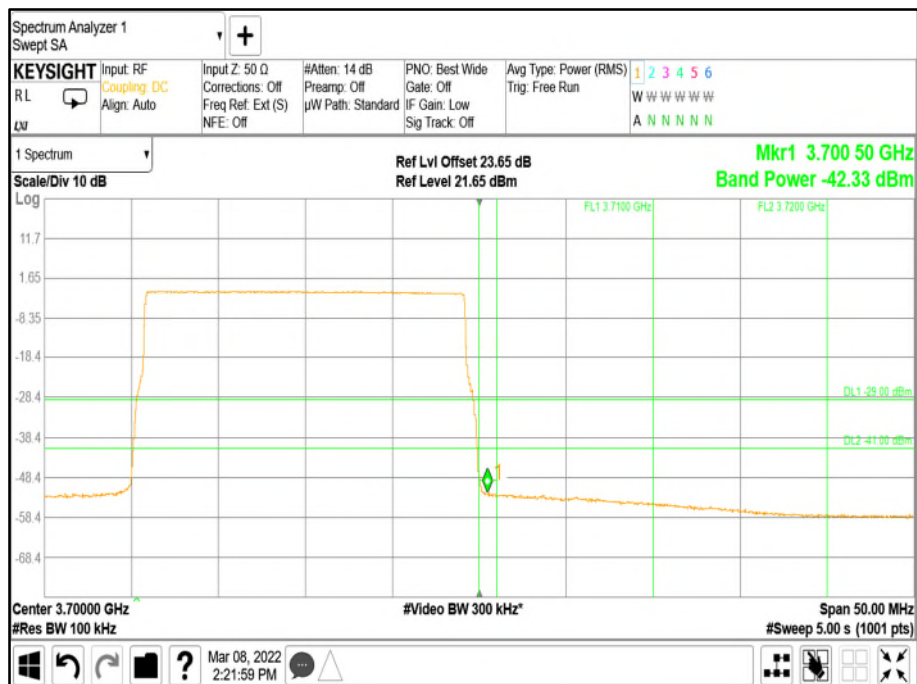
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 20.0 MHz - Channel Position T



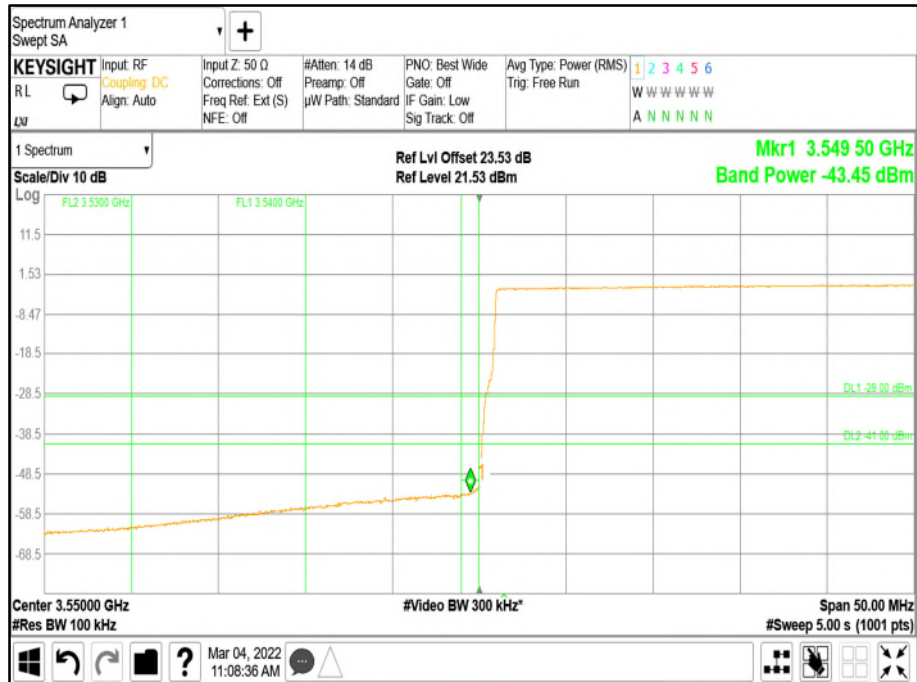
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 20.0 MHz - Channel Position B



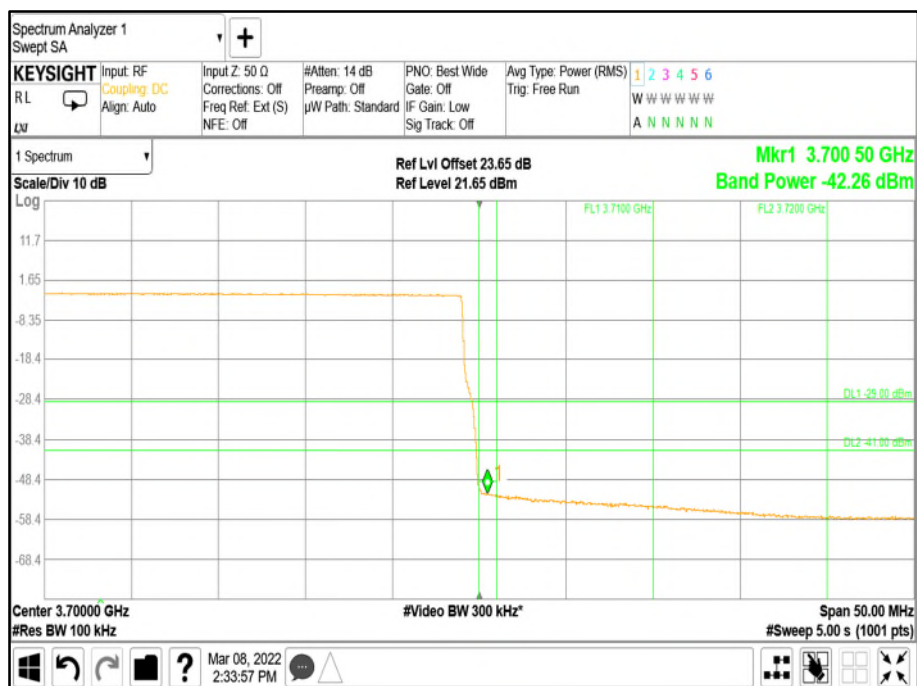
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 20.0 MHz - Channel Position T



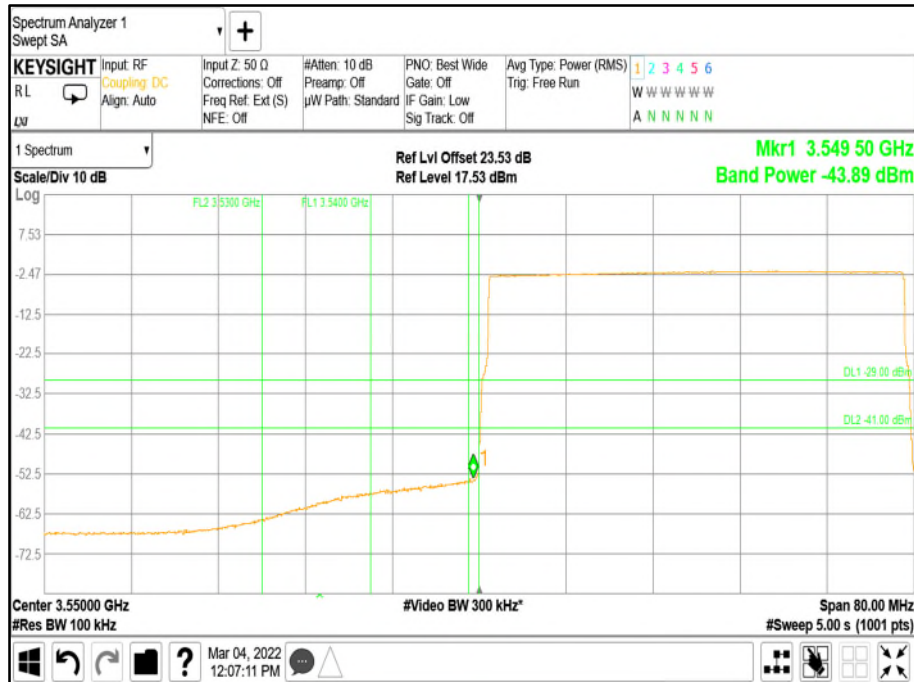
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 30.0 MHz - Channel Position B



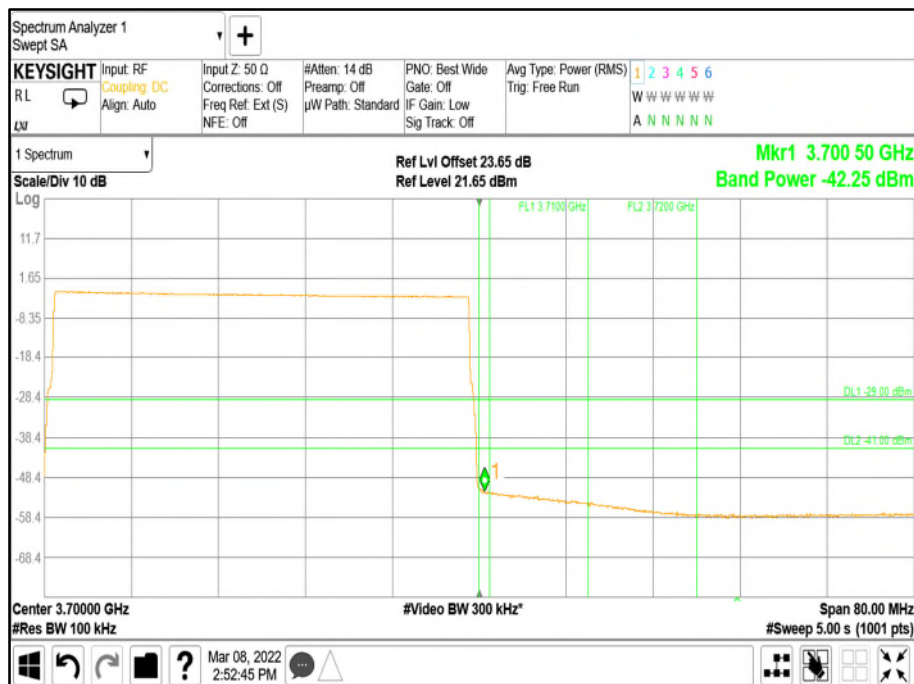
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 30.0 MHz - Channel Position T



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

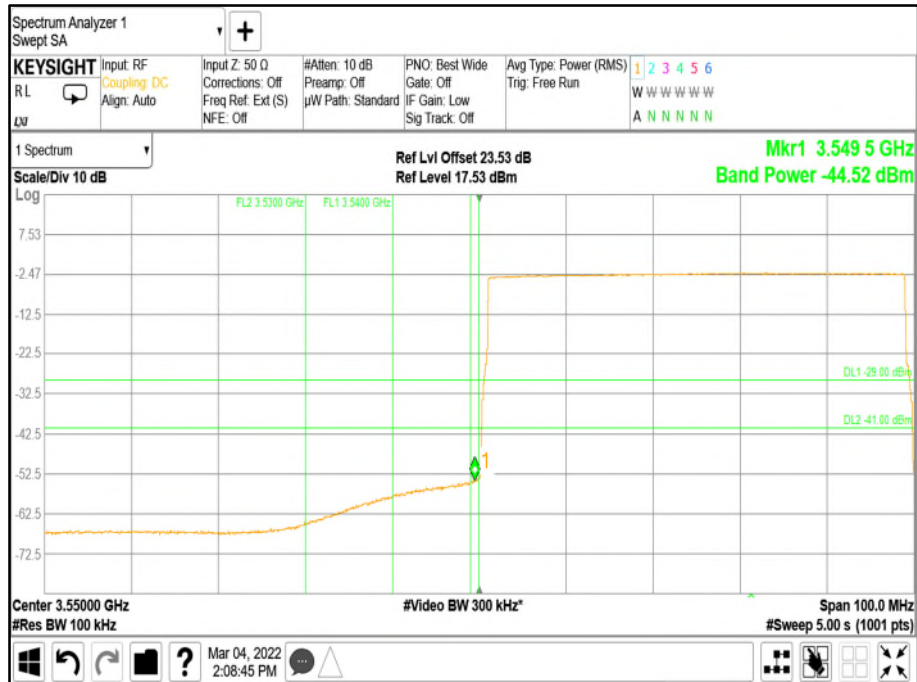


Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 40.0 MHz - Channel Position T

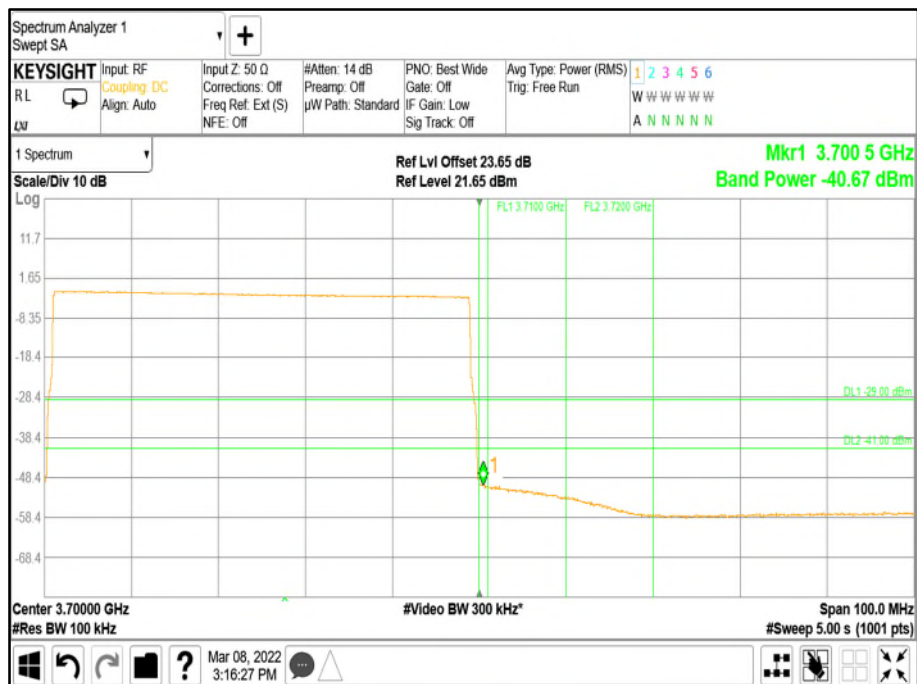




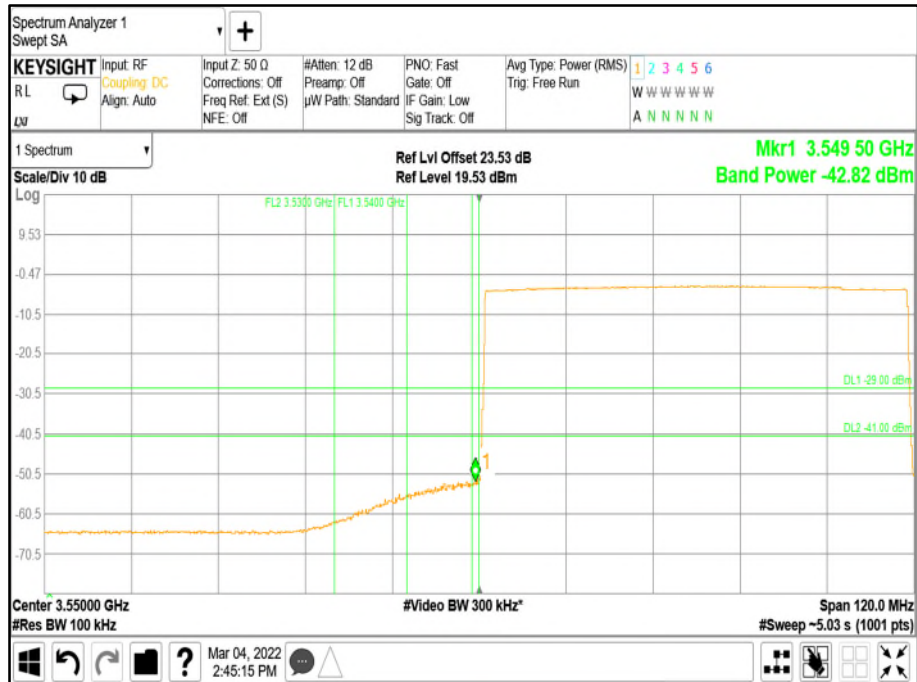
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position B



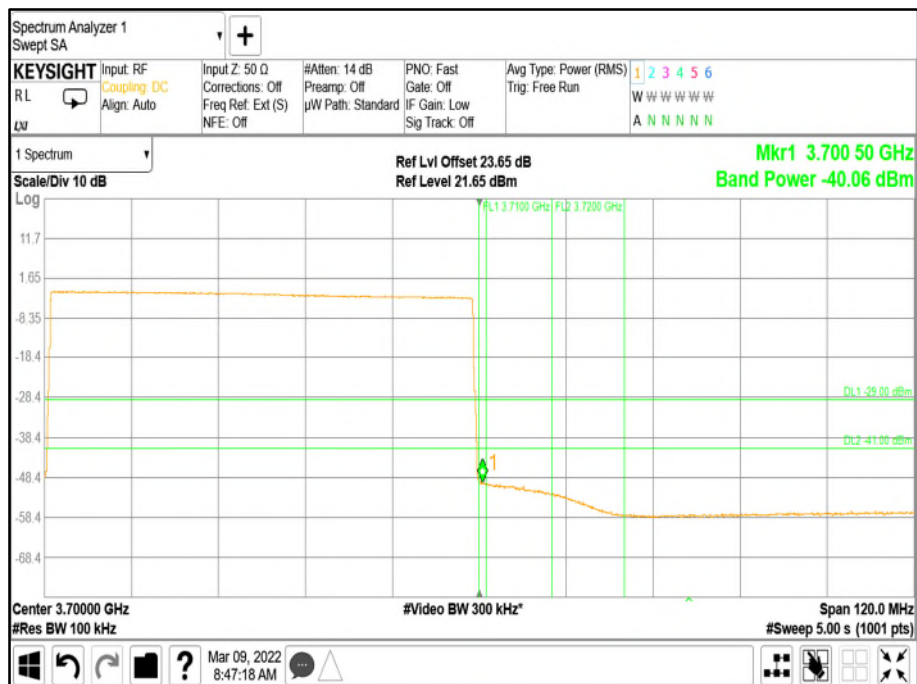
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position T



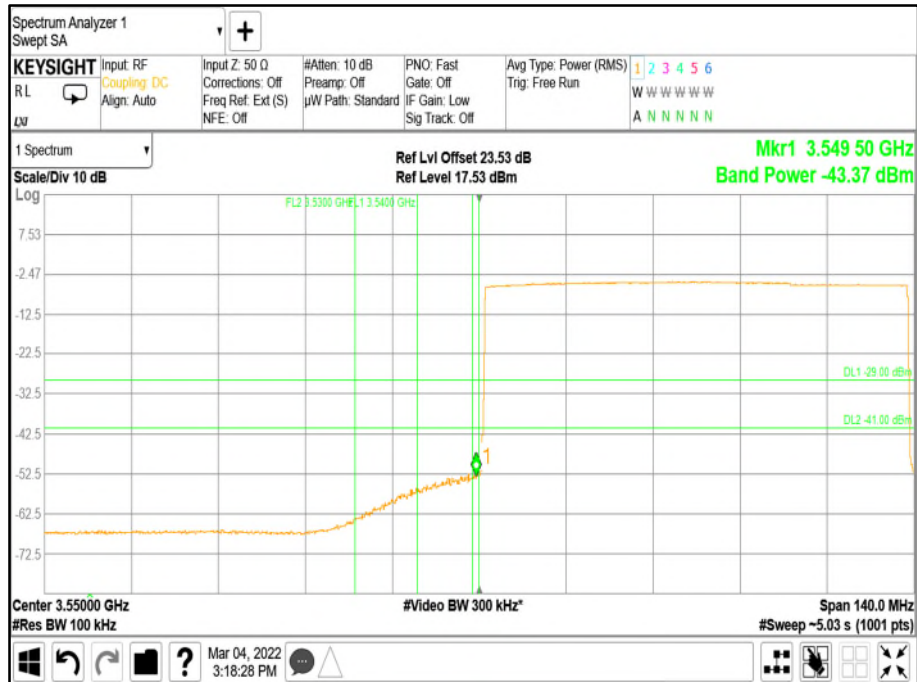
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 60.0 MHz - Channel Position B



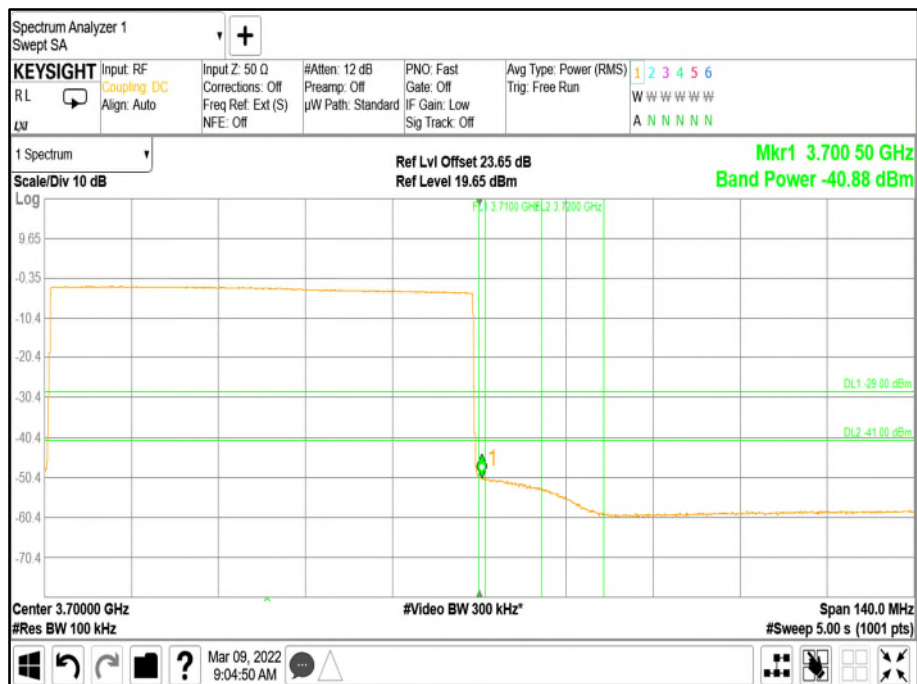
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 60.0 MHz - Channel Position T



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

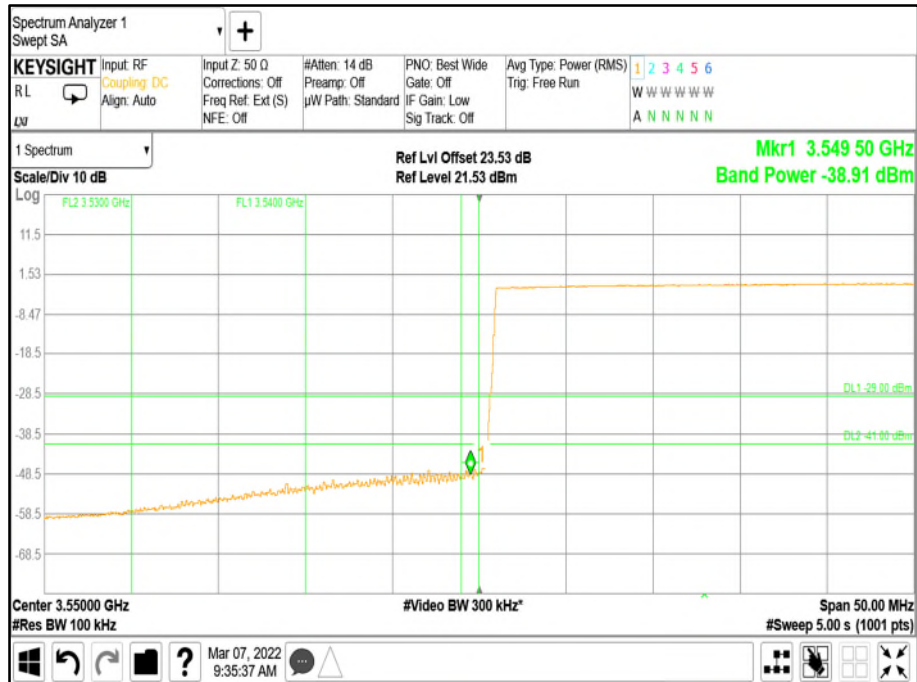


Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 70.0 MHz - Channel Position T

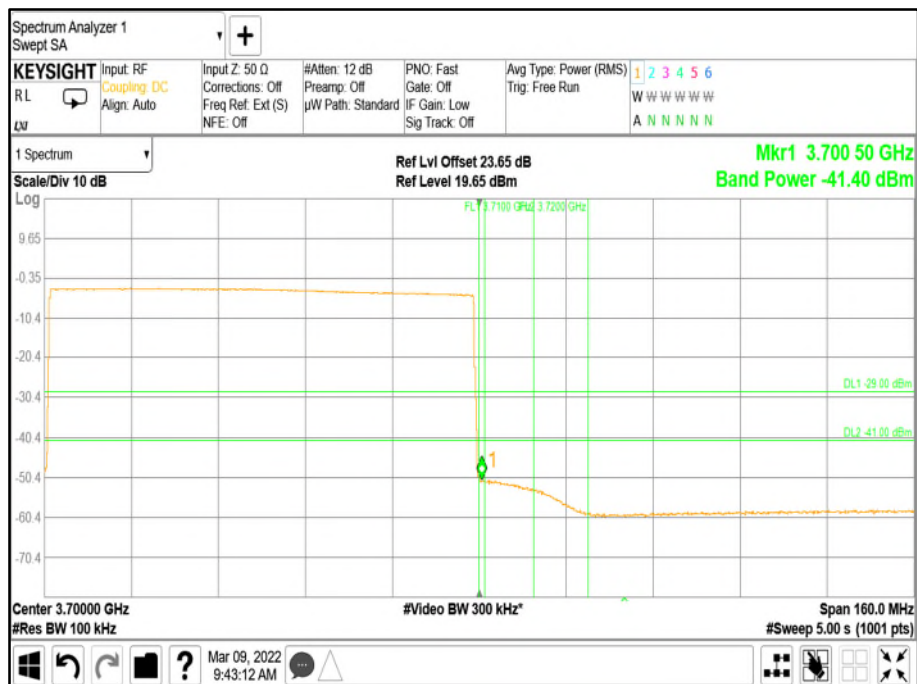




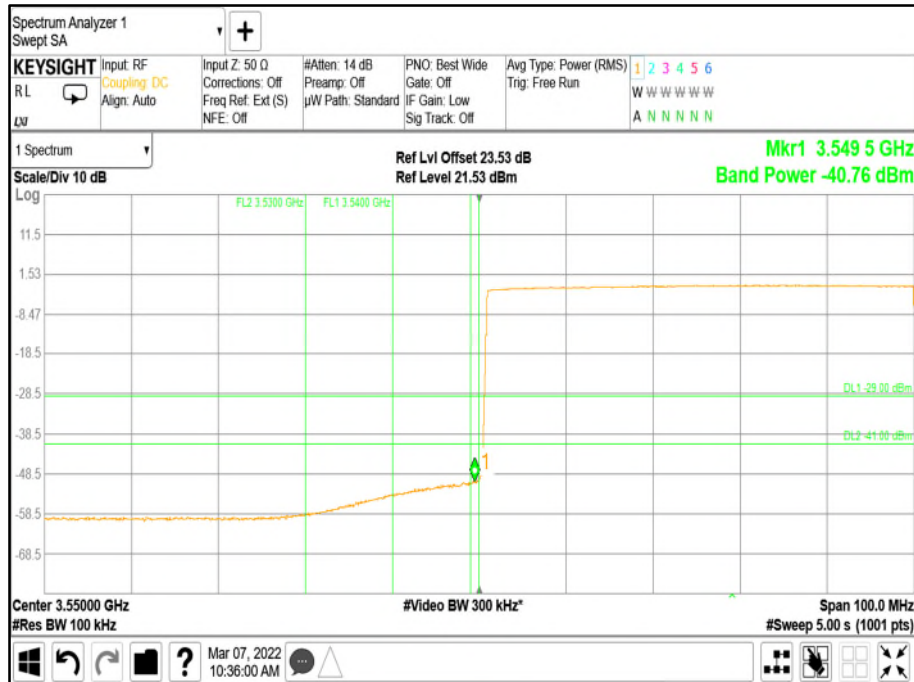
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 80.0 MHz - Channel Position B



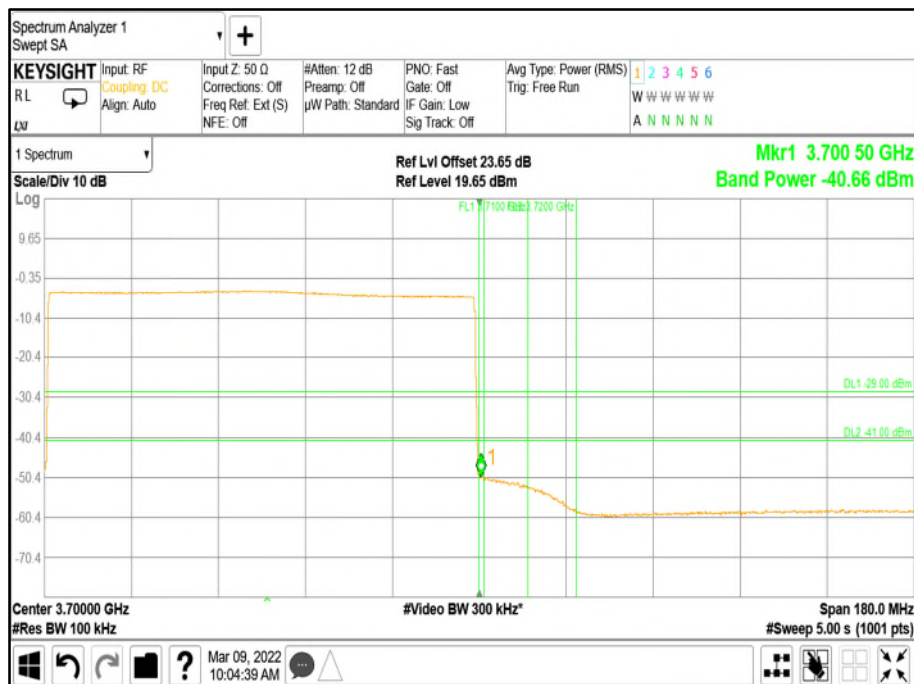
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 80.0 MHz - Channel Position T



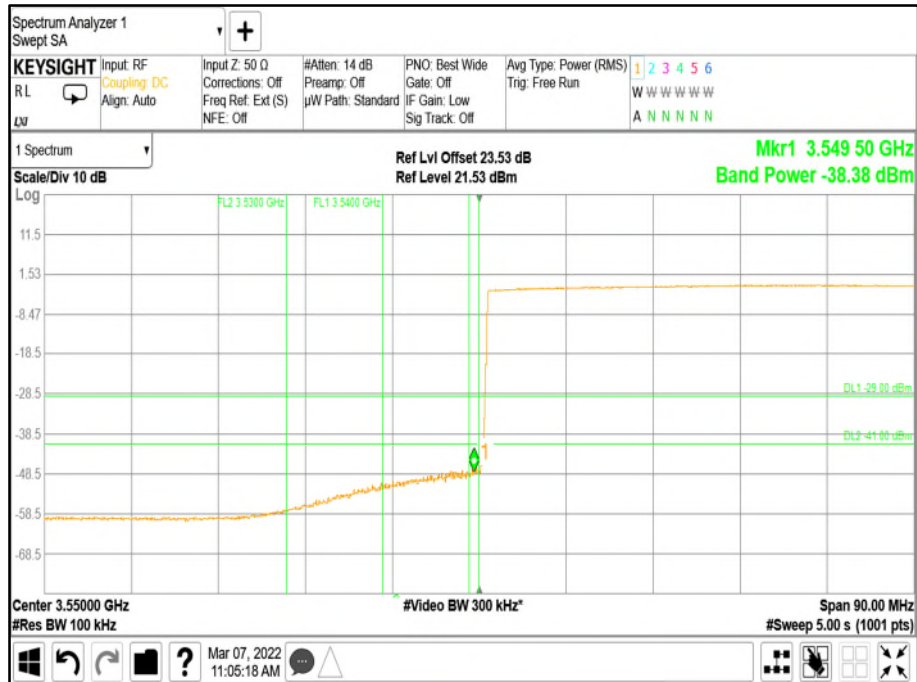
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 90.0 MHz - Channel Position B



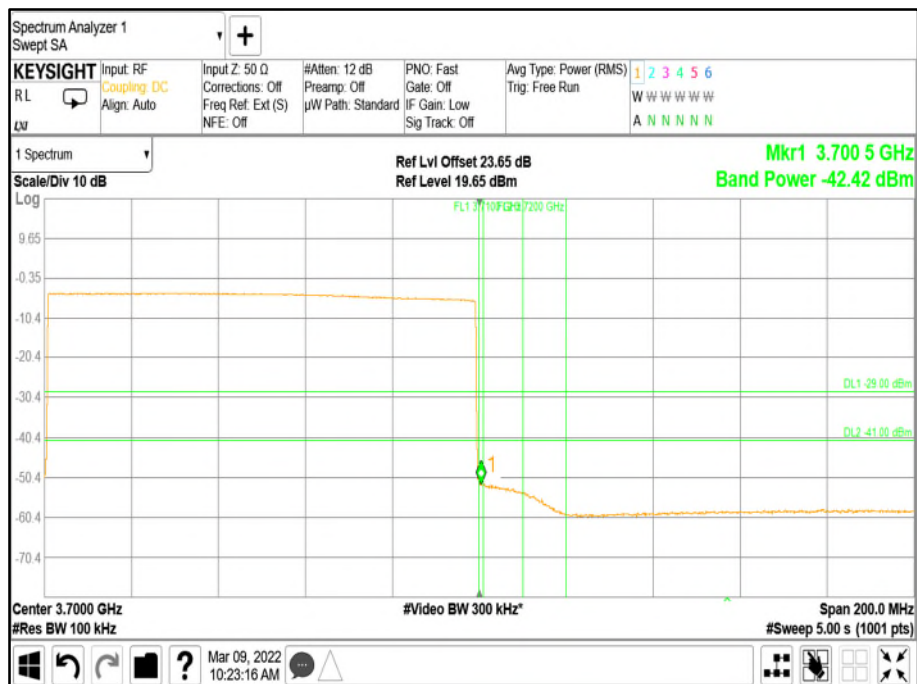
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth NR: 90.0 MHz - Channel Position T



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



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





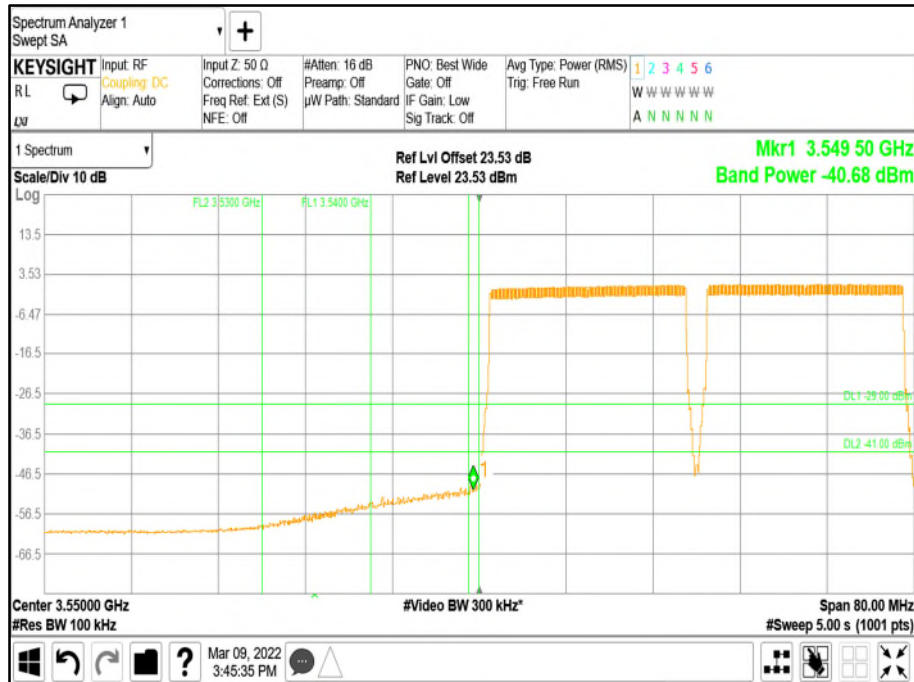
Configuration B

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	LTE: QPSK	10.0+10.0 MHz	3555.0+3565.0	3685.0+3695.0
A	LTE: QPSK	20.0+20.0 MHz	3560.0+3580.0	3670.0+3690.0
A	NR: QPSK	20.0+20.0 MHz	3560.0+3580.0	3670.0+3690.0
A	NR: QPSK	70.0+70.0 MHz	3585.0+3655.0	3595.0+3665.0
A	NR+LTE: QPSK	20.0+10.0 MHz	3560.0+3575.0	3680.0+3695.0

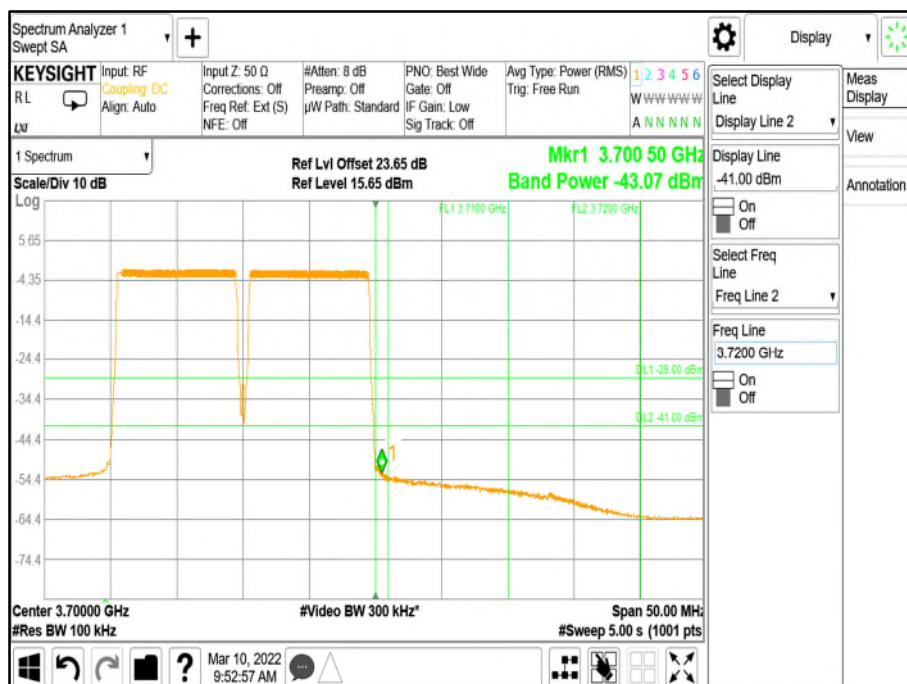
Remarks

The plots results represent typical radio performace.

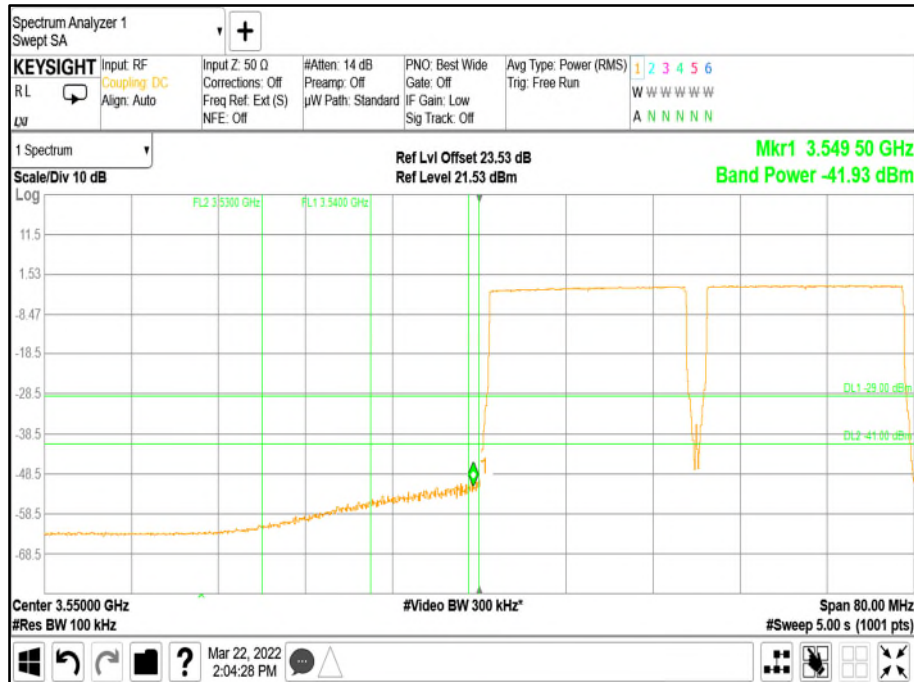
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position B



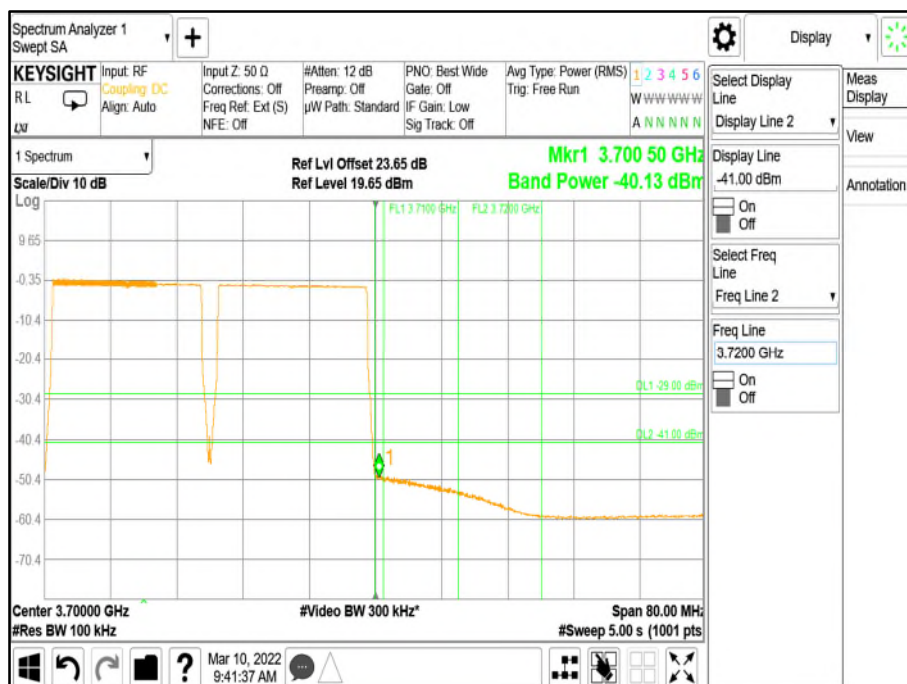
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 10.0+10.0 MHz - Channel Position T



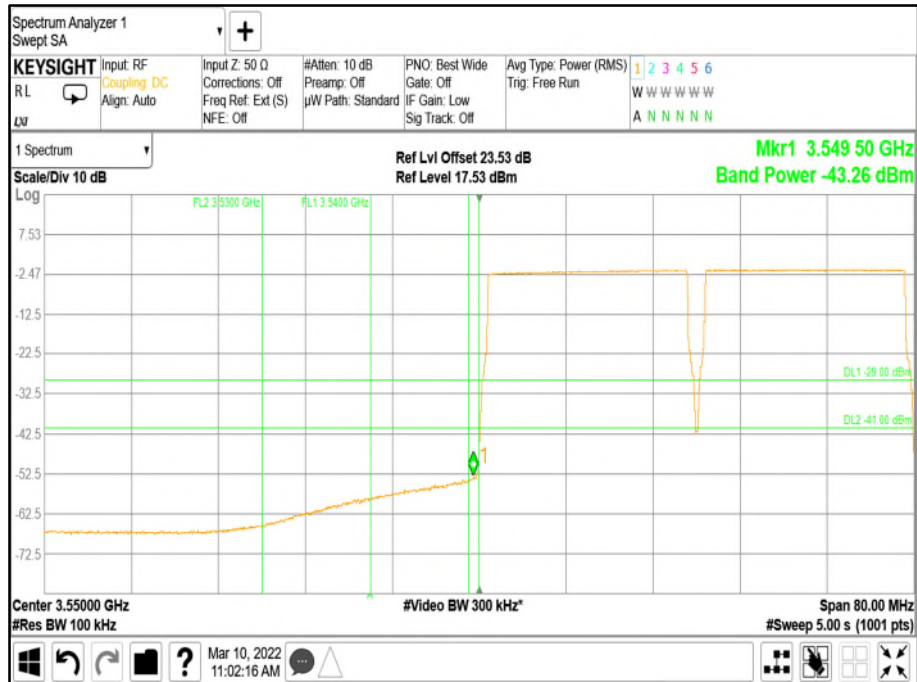
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position B



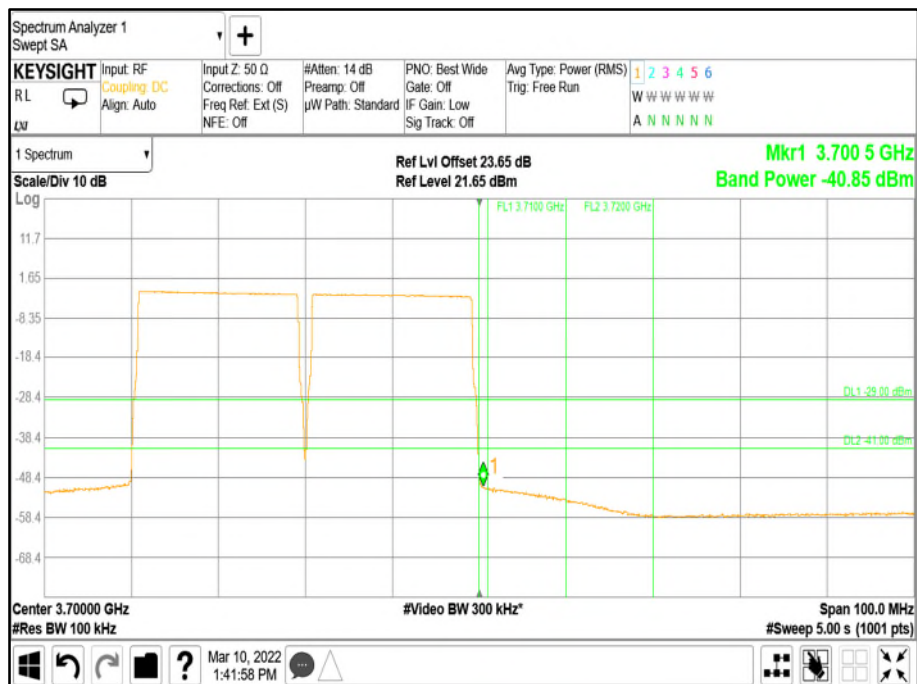
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position T



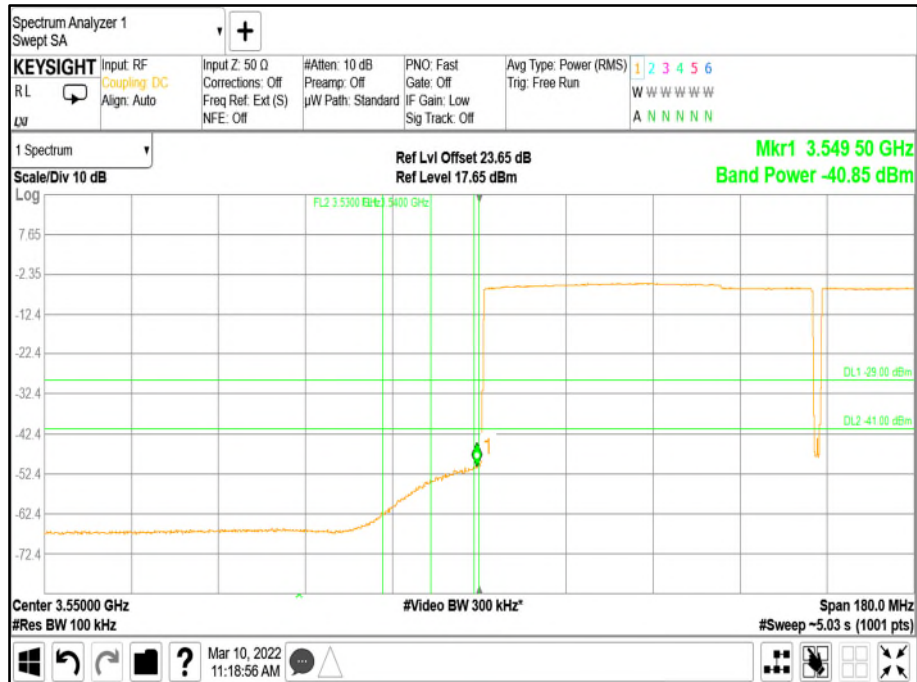
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position B



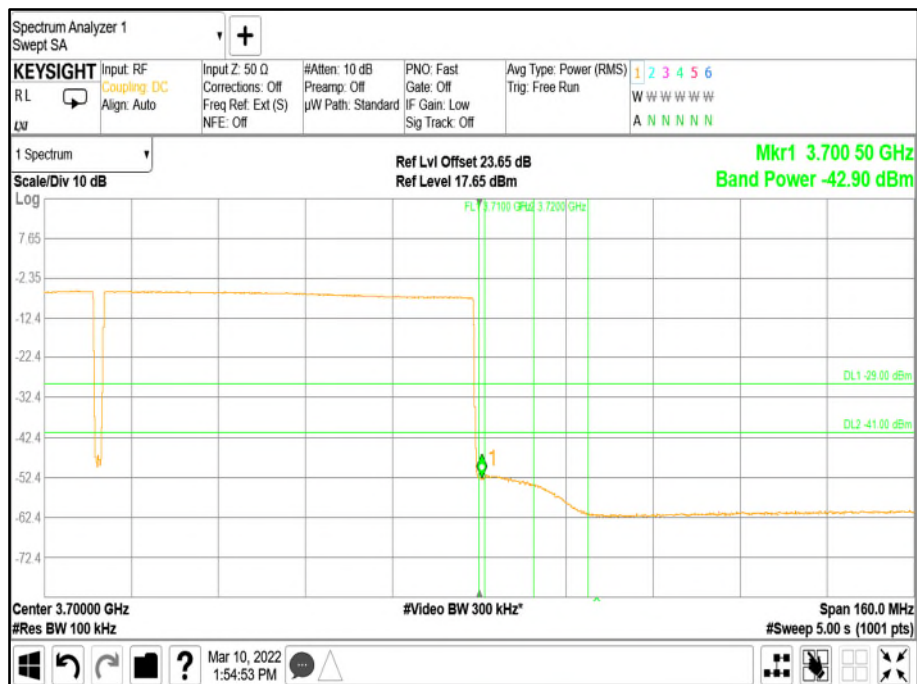
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 20.0+20.0 MHz - Channel Position T



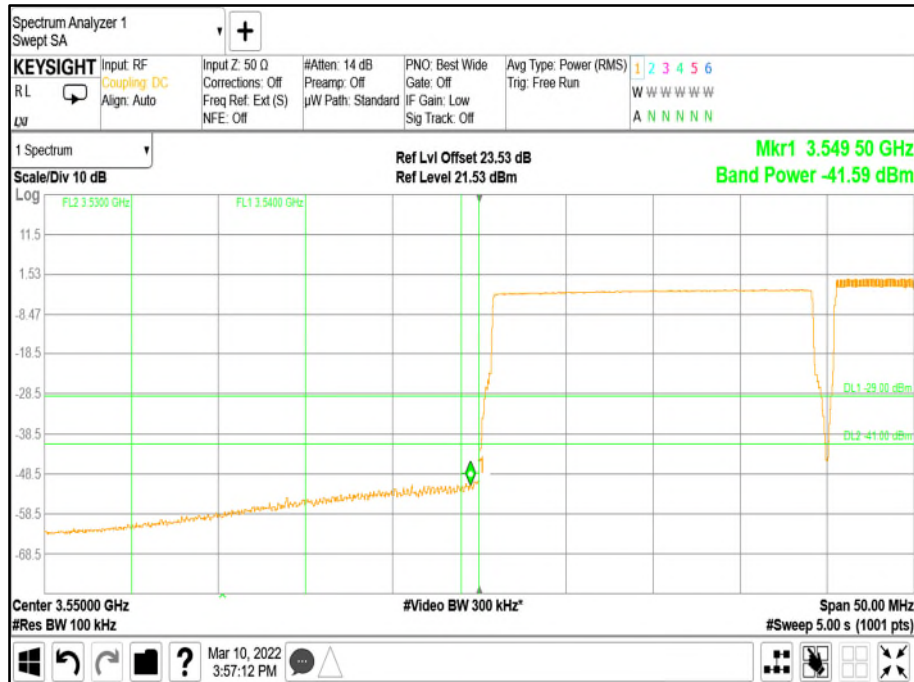
Antenna Port A A - Modulation NR: QPSK - Carrier Bandwidth 70.0+70.0 MHz - Channel Position B



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



Antenna Port A A - Modulation NR+LTE: QPSK - Carrier Bandwidth 20.0+10.0 MHz - Channel Position B



Antenna Port A A - Modulation NR+LTE: QPSK - Carrier Bandwidth 20.0+10.0 MHz - Channel Position T





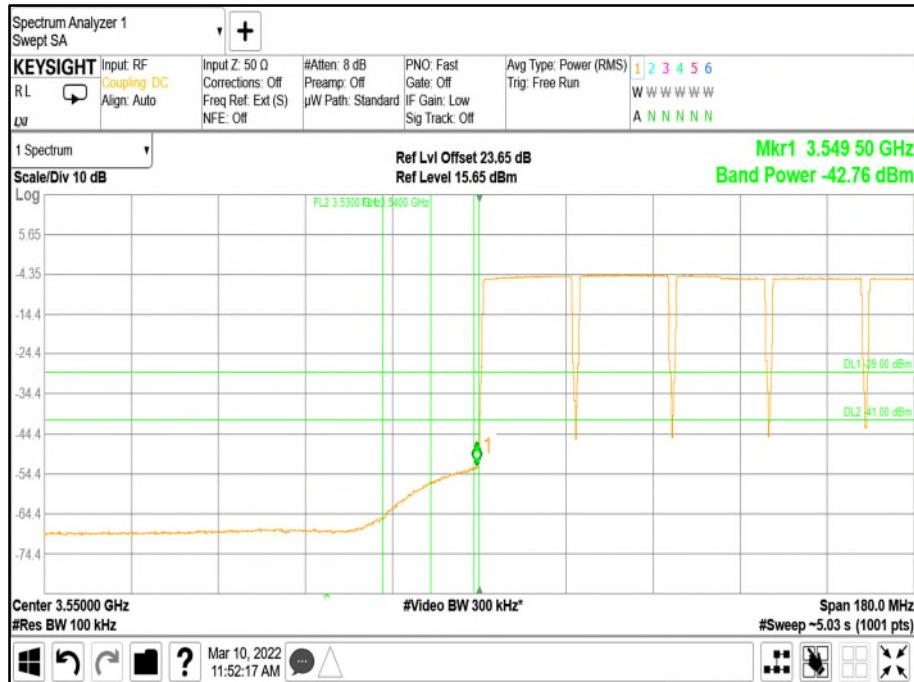
Configuration C

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	NR20: QPSK	20+20+20+20+20+20+20 MHz	3560.0+3580.0+3600.0+ 3620.0+3640.0+3660.0+ 3680.0	3570.0+3590.0+3610.0+ 3630.0+3650.0+3670.0+ 3690.0

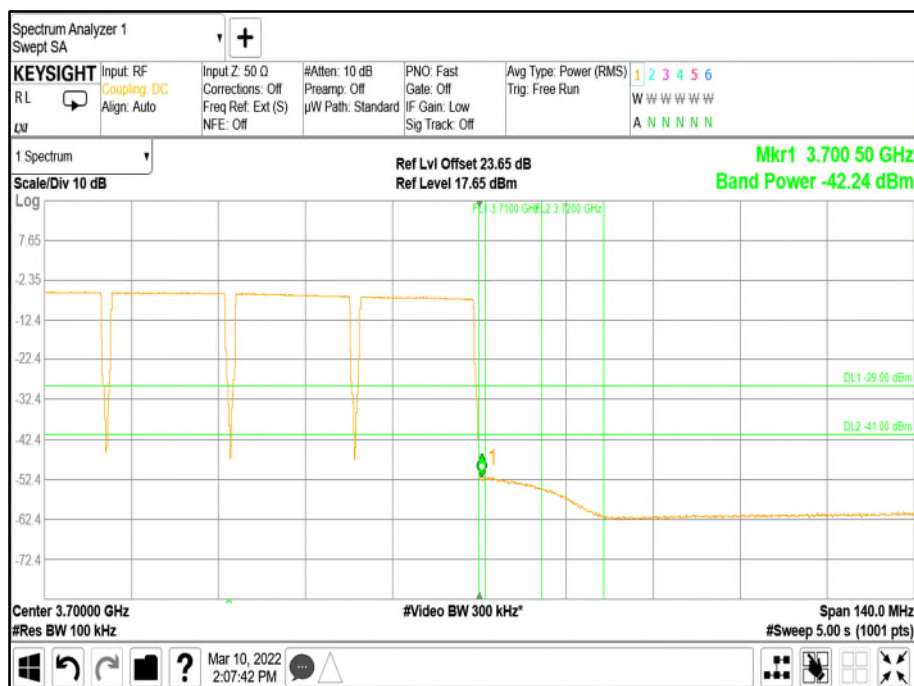
Remarks

The plots results represent typical radio performace.

Antenna Port A A - Modulation NR20: QPSK - Carrier Bandwidth 20+20+20+20+20+20+20 MHz
- Channel Position B



Antenna Port A A - Modulation NR20: QPSK - Carrier Bandwidth 20+20+20+20+20+20+20 MHz
- Channel Position T

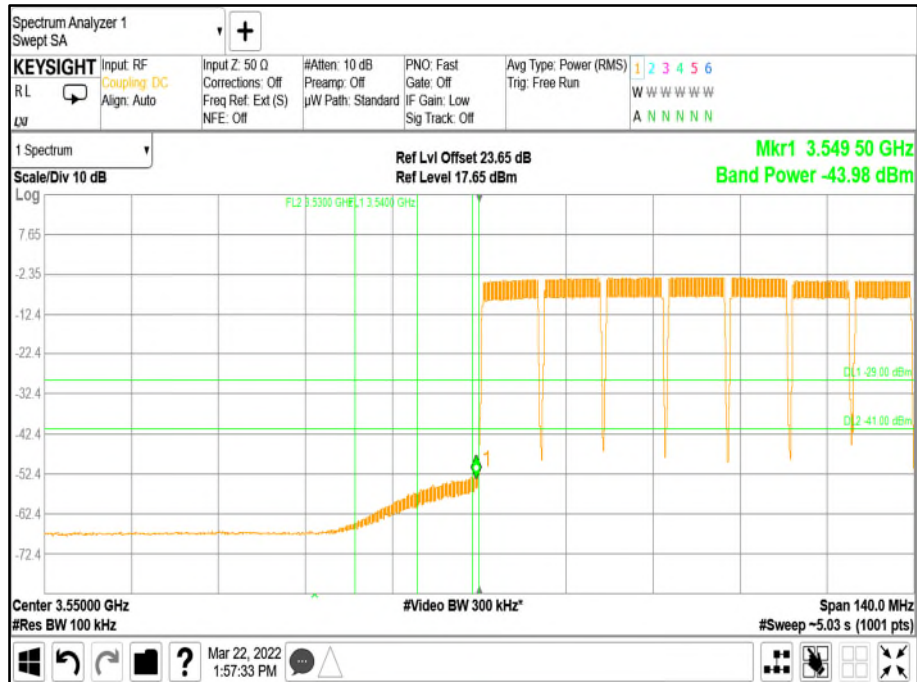




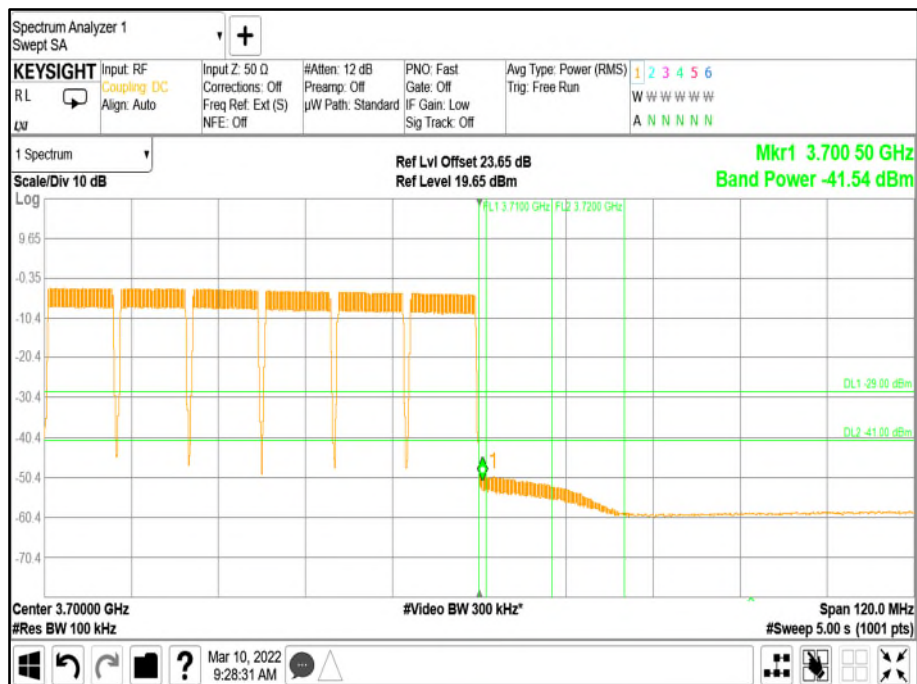
Configuration D

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	LTE: QPSK	10+10+10+10+10+10+10+10 MHz	3555.0+3565.0+3575.0+3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0	3585.0+3595.0+3605.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0
A	NR(3)+LTE(9): QPSK	20+20+20+10+10+10+10+10+10 MHz	3560.0+3580.0+3600.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0	3560.0+3580.0+3600.0+3615.0+3625.0+3635.0+3645.0+3655.0+3665.0+3675.0+3685.0+3695.0

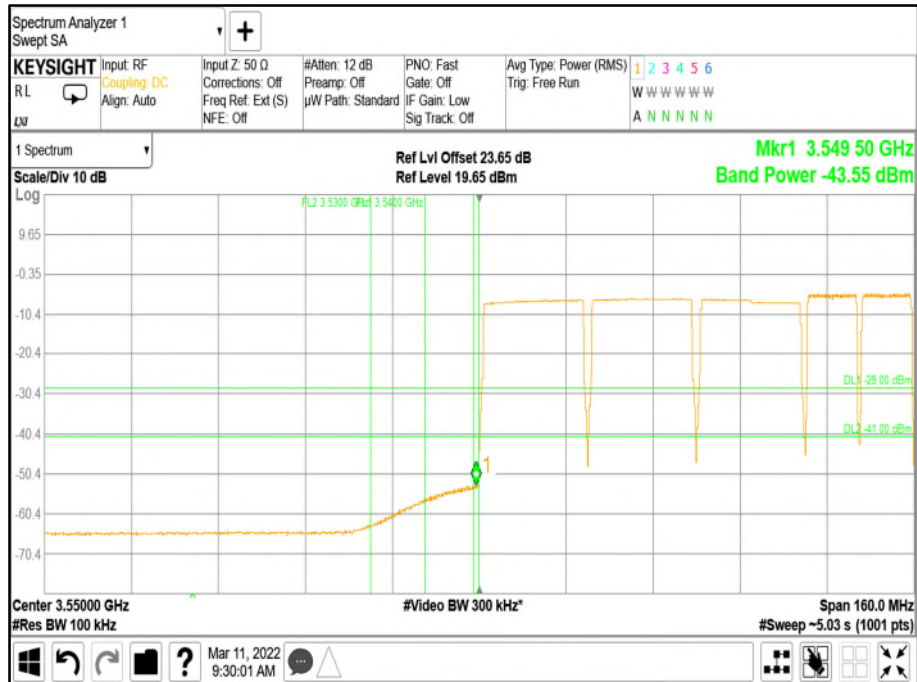
Antenna Port A A - Modulation LTE: QPSK - Carrier Bandwidth
10+10+10+10+10+10+10+10+10+10+10+10 MHz - Channel Position B



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



Antenna Port A A - Modulation NR(3)+LTE(9): QPSK - Carrier Bandwidth
20+20+20+10+10+10+10+10+10+10+10+10 MHz - Channel Position B



Antenna Port A A - Modulation NR(3)+LTE(9): QPSK - Carrier Bandwidth
20+20+20+10+10+10+10+10+10+10+10+10 MHz - Channel Position T

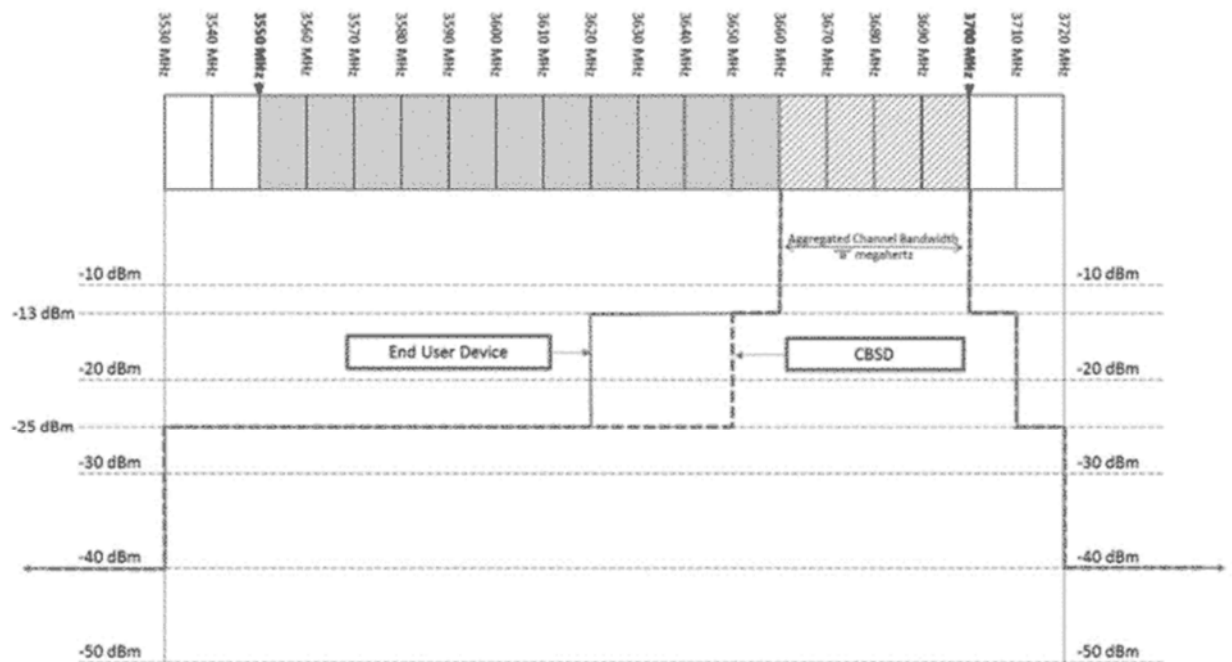


Limit	-13 dBm/MHz -10log(4) = -19 dBm/MHz (4 port MIMO)
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FCC 96.41 (e) 3.5 GHz Emissions and Interference Limits -

(1) General protection levels.

Figure 1 to paragraph (e) – Protection levels



(i) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by the SAS to CBSDs, the conducted power of any CBSD emission outside the fundamental emission bandwidth as specified in paragraph (e)(3) of this section (whether the emission is inside or outside of the authorized band) shall not exceed -13 dBm/MHz within 0-10 megahertz above the upper SAS-assigned channel edge and within 0-10 megahertz below the lower SAS-assigned channel edge. At all frequencies greater than 10 megahertz above the upper SAS assigned channel edge and less than 10 MHz below the lower SAS assigned channel edge, the conducted power of any CBSD emission shall not exceed -25 dBm/MHz. The upper and lower SAS assigned channel edges are the upper and lower limits of any channel assigned to a CBSD by an SAS, or in the case of multiple contiguous channels, the upper and lower limits of the combined contiguous channels. (ii) Except as otherwise specified in paragraph (e)(2) of this section, for channel and frequency assignments made by a CBSD to End User Devices, the conducted power of any End User Device emission outside the fundamental emission (whether in or outside of the authorized band) shall not exceed -13 dBm/MHz within 0 to B megahertz (where B is the bandwidth in megahertz of the assigned channel or multiple contiguous channels of the End User Device) above the upper CBSD-assigned channel edge and within 0 to B megahertz below the lower CBSD-assigned channel edge. At all frequencies greater than B megahertz above the upper CBSD-assigned channel edge and less than B megahertz below the lower CBSD-assigned channel edge, the conducted power of any End User Device emission shall not exceed -25 dBm/MHz. Notwithstanding the emission limits in this paragraph, the Adjacent Channel Leakage Ratio for End User Devices shall be at least 30 dB.

(2) Additional protection levels. Notwithstanding paragraph (e)(1) of this section, for CBSDs and End User Devices, the conducted power of emissions below 3540 MHz or above 3710 MHz shall not exceed -25 dBm/MHz, and the conducted power of emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.



2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 96, Clause 96.41 (e)(1)
FCC CFR 47 Part 2, Clause 2.1051

2.4.2 Date of Test and Modification State

17 and 22-March-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	24.6°C
Relative Humidity	30.8%

2.4.5 Test Method

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

Remarks:

1. Transceiver spurious emissions have been searched for all channel bandwidths and antenna ports.
2. Worst-case spurious emissions performance has been presented for all modulations.
3. Plot data performance for all channel bandwidths, and channel positions for both contiguous and non-contiguous (*NC) operation are on file and available on request.
4. Where applicable, the plot limit lines have been adjusted to reflect the integrated spurious level requirement of the defined rule part to the receiver measurement band width used.

Notes:

A 7 GHz spurious emission has been detected as significant on antenna port B.
All 4 antenna ports have been re-measured for comparison against the -40dBm / MHz limit.
The worst-case detected results have been entered in the tables below as well as presented in the plots.

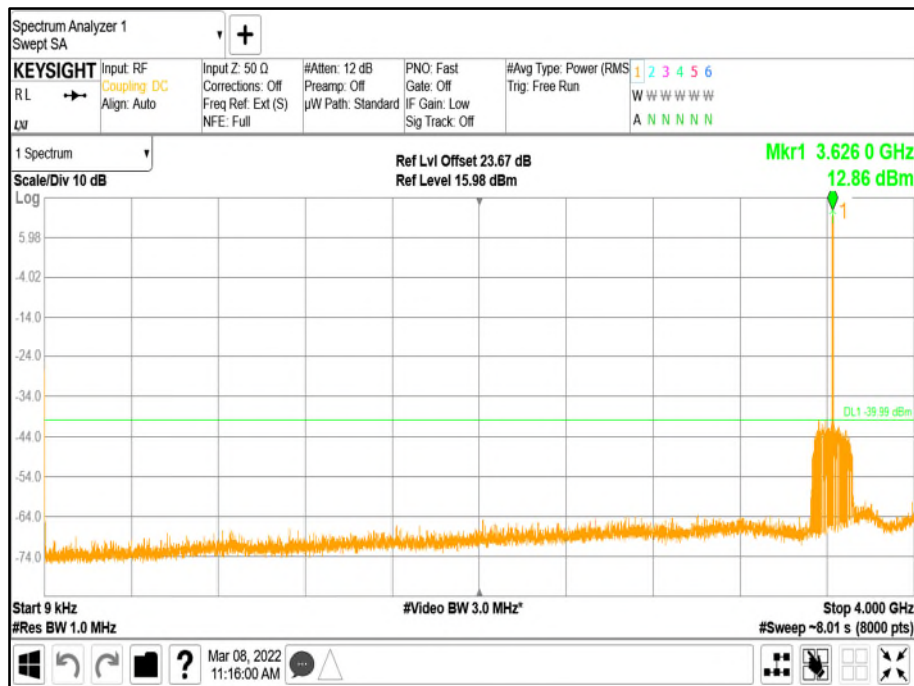


Spurious Emission Table (worst-case)								
Carrier Config.	RAT	Antenna Port Emission Level (dBm)				Total Combined Carrier Power (dBm)	Limit dBm/MHz	Margin of compliance (dB)
		A	B	C	D			
1 Carrier	LTE 5	-51.52	-43.68	-56.02	-50.13	-42.06857	-40	-2.068578
	NR 50	-55.1	-40.99	-54.13	-49.86	-40.13687	-40	-0.136873
2 Carrier	LTE20+LTE20	-57.53	-41.02	-55.73	-50.32	-40.32468	-40	-0.324680
	*LTE20+LTE20	-48.19	-42.26	-56.02	-47.52	-40.23186	-40	-0.231863
	NR20+NR20	-58.47	-42.27	-58.08	-51.88	-41.62681	-40	-1.626819
	*NR20+NR20	-48.19	-42.26	-56.02	-47.52	-40.23186	-40	-0.231863
	NR20+LTE10	-55.12	-41.84	-54.77	-50.57	-40.93428	-40	-0.934280
	*NR20+LTE10	-48.03	-44.46	-60.55	-49.99	-42.04442	-40	-2.044427
7 Carrier	NR20	-54.4	-44.16	-55.73	-50.29	-42.67376	-40	-2.673765
12 Carrier	LTE10	-55.45	-40.94	-57.43	-50.57	-40.27029	-40	-0.270290
	3xNR20+9xLTE10	-52.68	-45.14	-54.77	-49.92	-43.05088	-40	-3.050885
Note: * Non-Contiguous Configuration								

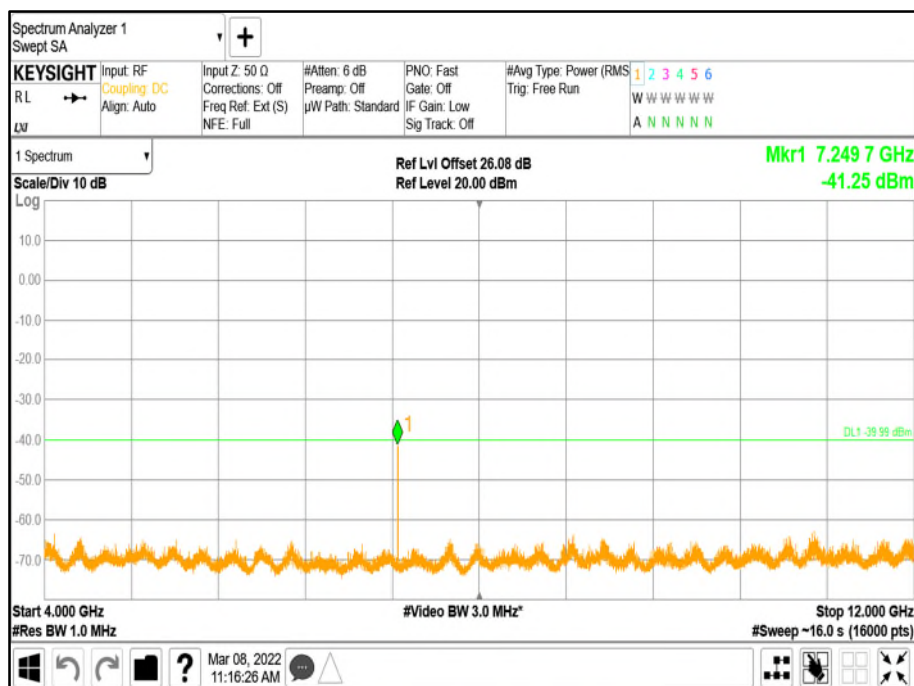
2.4.6 Test Results

Configuration A

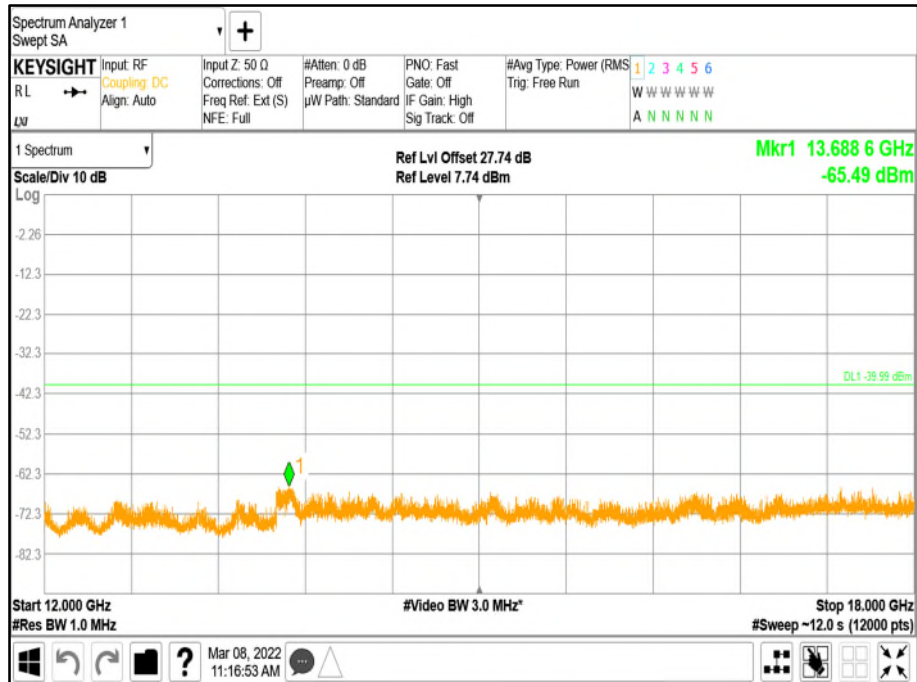
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M -
Band 1.00 - Range 0.009 to 4000 MHz



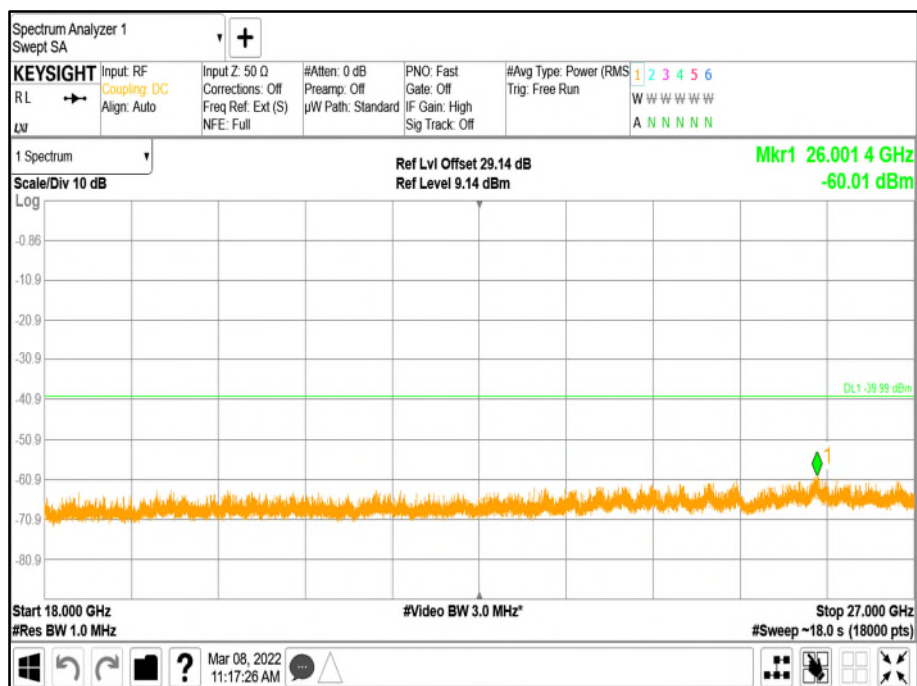
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M -
Band 2 - Range 4000 to 12000 MHz



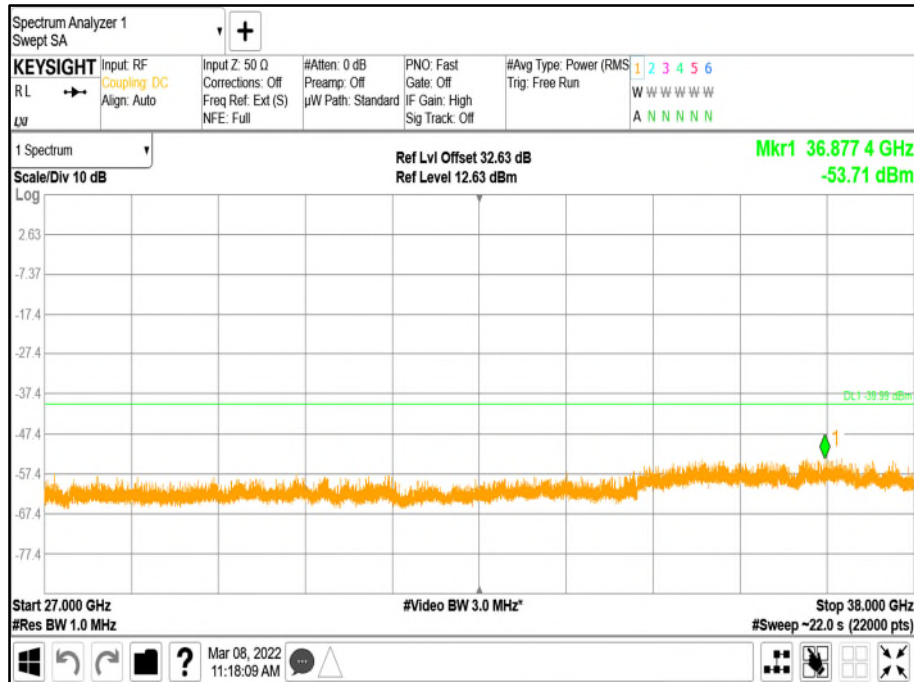
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



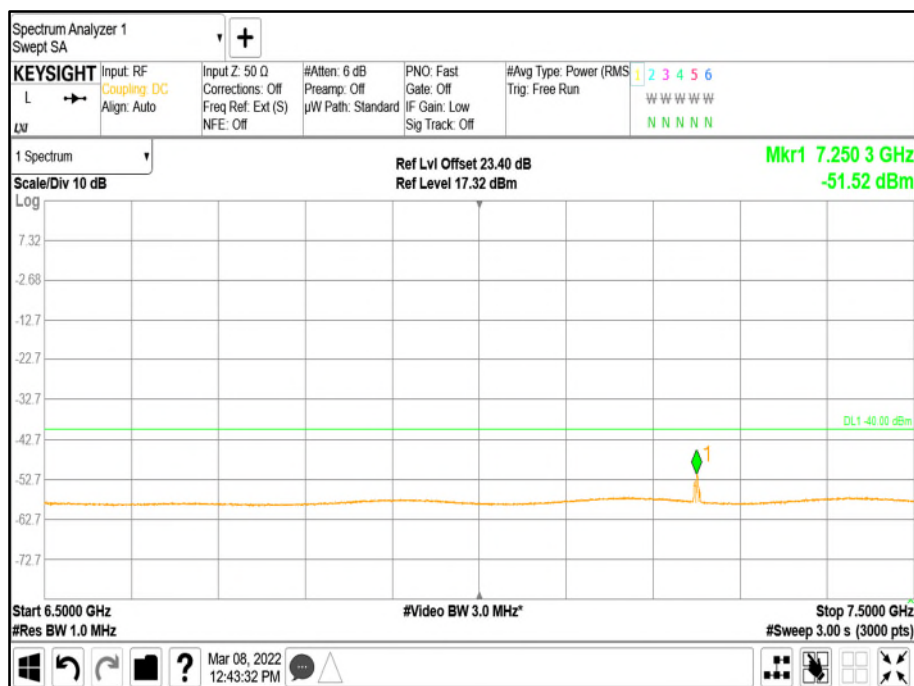
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 4 - Range 18000 to 27000 MHz



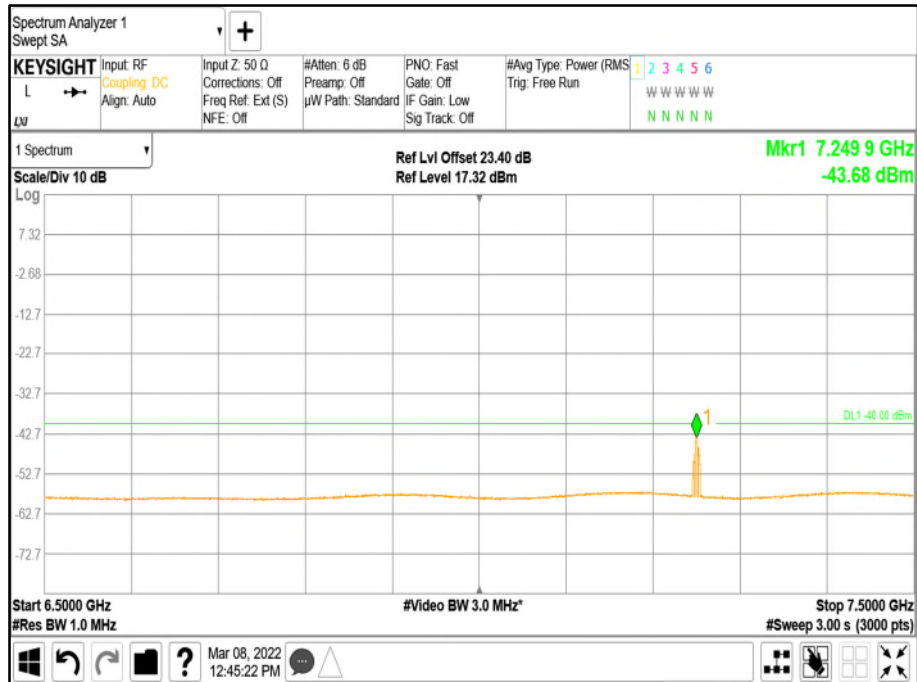
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 5 - Range 27000 to 38000 MHz



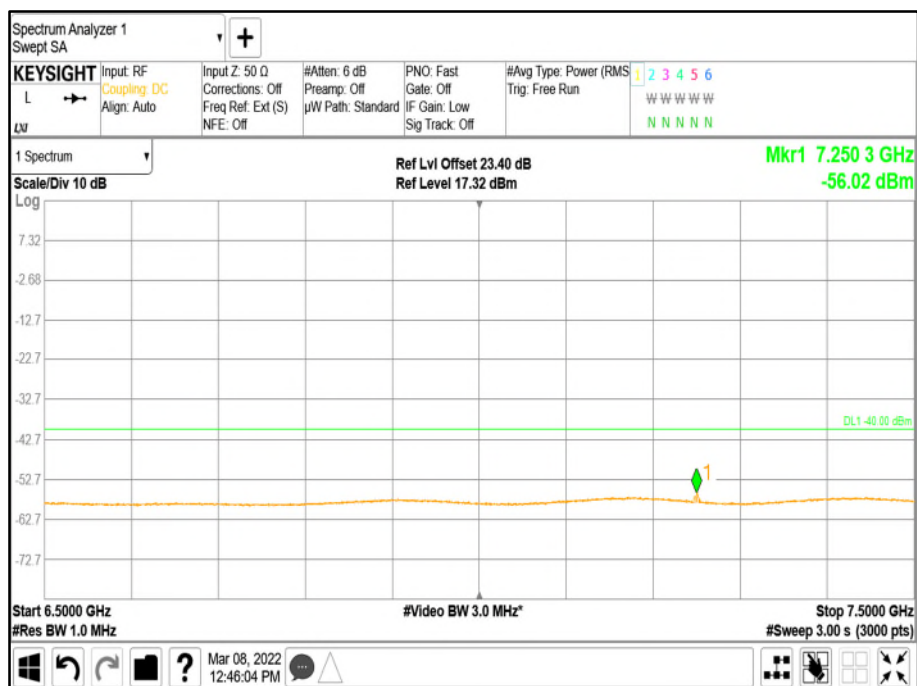
Antenna A - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 2 - Range 7 GHz Spurious Port A



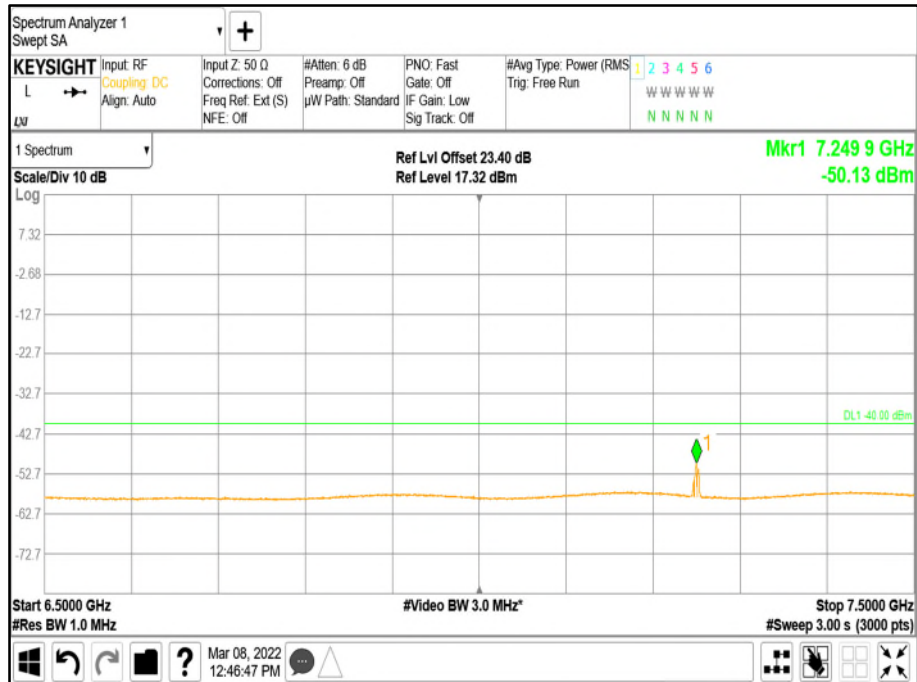
Antenna B - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 2 - Range 7 GHz Spurious Port B



Antenna C - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 2 - Range 7 GHz Spurious Port C



Antenna D - Modulation LTE: QPSK - Carrier Bandwidth LTE: 5 MHz - Channel Position M - Band 2 - Range 7 GHz Spurious Port D



Antenna B - Modulation NR: QPSK - Carrier Bandwidth NR: 50.0 MHz - Channel Position B - Band 1.00 - Range 0.009 to 4000 MHz

