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Report On

FCC and ISED Testing of the
Ericsson RD 2242 B4, KRY 901 309/1, NR, NR + LTE (2100 MHz)
Base Station in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27, ISED RSS-GEN and Industry Canada RSS-139

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8BKRY901309-1
ISED ID: 287AB-AS9013091

PREPARED BY	APPROVED BY	DATED
		April 14th 2021

Authorised Signatory

Document 7169009108.3 Report 02 Issue 1 **March 2021**

CONTENTS

Section **Page No**

SECTION 1

REPORT INFORMATION

1.1 REPORT DETAILS

Manufacturer	Ericsson
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name & Product Number	RD 2242 B4 & KRY 901 309/1
IC Model Name	AS9013091
Serial Number(s)	C828676641
Software Version	CXP9013268/14 Rev R80BY
Hardware Version	R2A
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2019 FCC CFR 47 Part 27: 2019 ISED RSS-GEN: Issue 5: March 2019 Amendment 1 Industry Canada RSS-139: Issue 3: 2015
Test Plan	RDS_IRU+RD_B4_RA_testplan
Start of Test	24 February 2021
Finish of Test	24 February 2021
Name of Engineer(s)	Glen Westwell
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01

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 FCC CFR 47 Part 2: 2019, FCC CFR 47 Part 27: 2019, ISED RSS-GEN: Issue 5: March 2019 Amendment 1, Industry Canada RSS-139: Issue 3: 2015. 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

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 27, ISED RSS-GEN and Industry Canada RSS-139 is shown below.

Section	Specification Clause				Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 27	RSS-GEN	RSS-139		
2.1	2.1046	27.50	6.12	6.4	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	27.53	6.7	-	Occupied Bandwidth	Pass
2.3	2.1051	27.53 (h)	-	6.5	Band Edge	Pass
2.4	2.1051	27.53 (h)	6.13 / 7.4	6.5	Transceiver Spurious Emissions	Pass

1.3 CONFIGURATION DESCRIPTION

Configuration A					
RAT	N0. Of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	1	5 MHz	2112.5	2132.5	2152.5
		10 MHz	2115.0	2132.5	2150.0
		15 MHz	2117.5	2132.5	2147.5
		20 MHz	2120.0	2132.5	2145.0

Configuration B					
RAT	N0. Of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR+LTE NR	2	5 MHz	2112.5+2117.5	2130.0+2135.0	2147.5+2152.5
		15 MHz	2117.5+2125.0	2122.5+2142.5	2140.0+2147.5
		20 MHz	2120.0+2140.0	2120.0+2140.0	2125.0+2145.0

Configuration C					
RAT	N0. Of Carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
			Bottom	Middle	Top
NR	4	5 MHz	2112.5+2117.5+2122.5+2127.5	2125.0+2130.0+2135.0+2140.0	2137.5+2142.5+2147.5+2152.5
		10 MHz	2115.0+2125.0+2135.0+2145.0	2117.5+2127.5+2137.5+2147.5	2120.0+2130.0+2140.0+2150.0

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio DOT (Multi-standard)
MANUFACTURER	Ericsson
PRODUCT NAME	Remote Radio Unit
PART NUMBER	KRY 901 309/1
SERIAL NUMBER	C828676641
HARDWARE VERSION	R2A
SOFTWARE VERSION	CXP9013268/14 R80BY
TRANSMITTER OPERATING RANGE	2110MHz – 2155MHz
RECEIVER OPERATING RANGE	1710MHz – 1755MHz
COUNTRY OF ORIGIN	Sweden
INTERMEDIATE FREQUENCIES	DL: 110-150 MHz, UL: 40-80 MHz
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	**WCDMA:** 5M00F9W **LTE:** 5M00W7D, 10M0W7D, 15M0W7D, 20M0W7D **NR:** 5M00F9W, 10M0F9W, 15M0F9W, 20M0F9W
MODULATION TYPES: (i.e. GMSK, QPSK)	**LTE/NR:** QPSK, 16QAM, 64QAM, 256QAM **WCDMA**: QPSK, 16QAM, 64QAM
OUTPUT POWER (W or dBm)	SC, MC, MM: 2 x 0.5W (17dBm)
Antenna Gain (dBi)	2.5 dBi
FCC ID	TA8BKRY901309-1
INDUSTRY CANADA ID	287AB-AS9013091
IC HVIN	AS9013091
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RD 2242 B4 (KRY 901 309/1) is a Remote Radio Unit forming part of the Ericsson Radio Base Station (RBS) equipment. The RD provides radio access for mobile and fixed devices and is intended for the indoor environment. The radio operates over 2 Transmit ports in MRO; Single, Multi-Carrier, and MIMO transmission with a maximum rated RF Output of 0.05W per port over an operational temperature of +5°C to +40°C. The unit is designed to be ceiling mounted.

Signature:

……

Denis Lalonde

Date: 22 March 2021

Declaration of Build Status Serial Number: C829931604

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

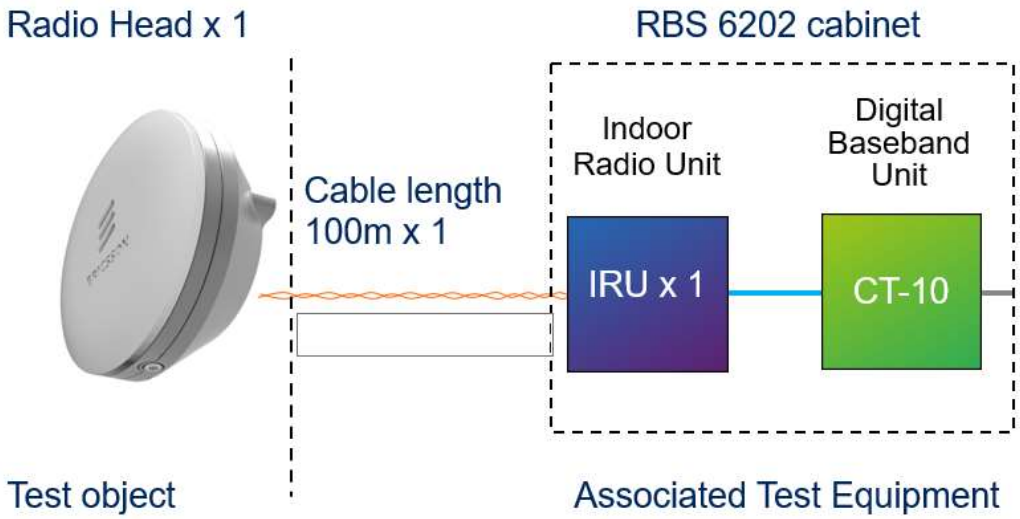
1.5 PRODUCT INFORMATION

1.5.1 Technical Description

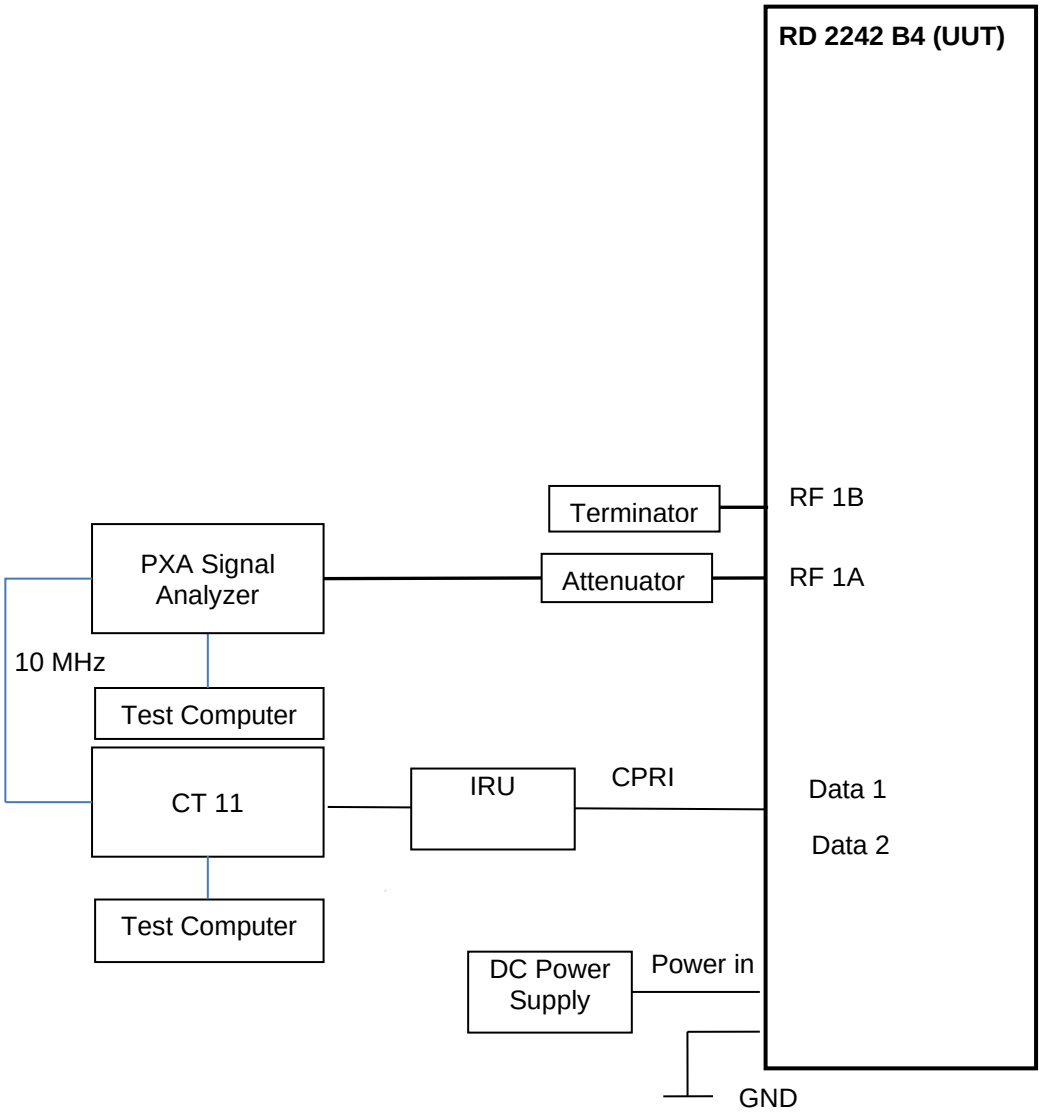
The Equipment Under Test (EUT) RD 2242 B4 is an Ericsson AB Radio Unit working in the public mobile service 2100MHz band which provides communication connections to 2100MHz network. The RD 2242 B4 operates from a -48V DC supply.

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



1.6 TEST SETUP



1.7 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

ISED Accreditation
ISED#24015, TUV SUD, Ottawa, Canada

Under our group A2LA Accreditation, TÜV SÜD conducted the following tests at the Ericsson facility in Ottawa.

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

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 Class 2 Permissive change to add NR, NR+LTE modulations to a previously certified Radio for use in the USA and Canada under the following ID's:

FCC ID: TA8BKRY901309-1
ISED ID: 287AB-AS9013091

2. This device is electrically identical as originally certified as no hardware changes have been made.

3. Transmitter performance was measured for top, mid & bottom channels, where aplicable, accross both antenna ports as presented in the average power measurement tables. Maximum power performance is presented.

4. Frequency Stability has been verified at time of original certification.

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
Industry Canada RSS-139, Clause 6.4
FCC CFR 47 Part 2, Clause 2.1046

2.1.2 Date of Test and Modification State

24 February 2021 - 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	24.9°C
Relative Humidity	29.8%

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 17.00 dBm / Port

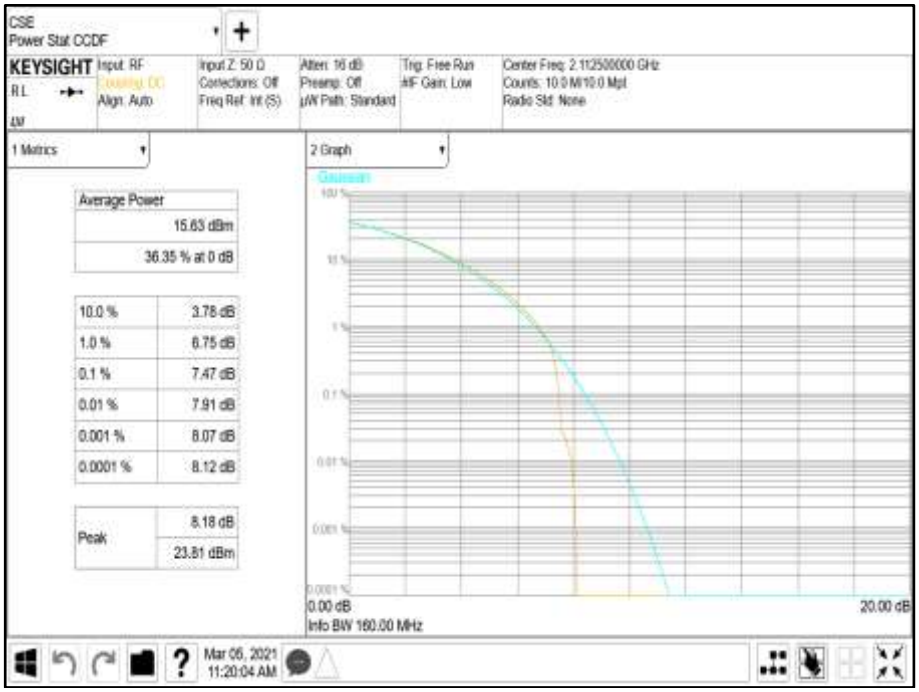
Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
			Channel Position B				
			PAR (dB)	Average Power			
				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz
A	NR: QPSK	5.0 MHz	8.18	15.79	18.29	10.51	13.01
B	NR: QPSK	5.0 MHz	-	15.71	18.21	10.51	13.01
Total			-	18.76	21.26	13.52	16.02
A	NR: QPSK	10.0 MHz	7.68	16.17	18.67	7.41	9.91
B	NR: QPSK	10.0 MHz	-	16.04	18.54	7.41	9.91
Total			-	19.12	21.62	10.42	12.92
A	NR: QPSK	15.0 MHz	7.71	16.23	18.73	5.60	8.10
B	NR: QPSK	15.0 MHz	-	16.11	18.61	5.60	8.10
Total			-	19.18	21.68	8.61	11.11
A	NR: QPSK	20.0 MHz	7.67	16.30	18.80	4.25	6.75
B	NR: QPSK	20.0 MHz	-	16.22	18.72	4.25	6.75
Total			-	19.27	21.77	7.26	9.76

Remarks

1. Transmitter performance was measured for top, mid, bottom channels accross both antenna ports as represented in the average power measurement tables. Maximum power performance is presented.
2. Plot data performances are on file and available on request.
3. The Antenna gain for this RD 2242 B4 is 2.5 dBi.

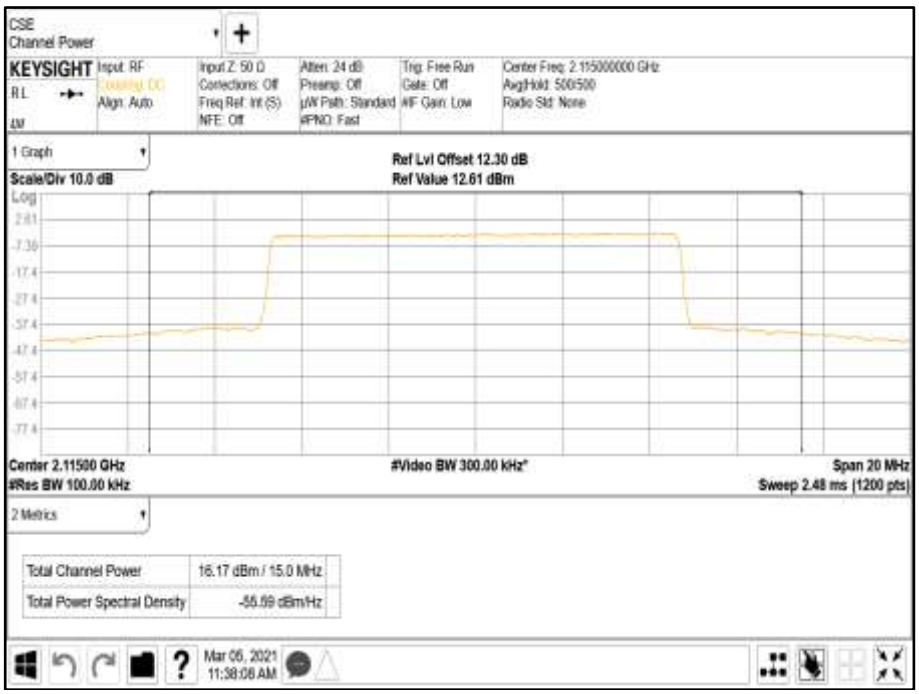
Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B

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

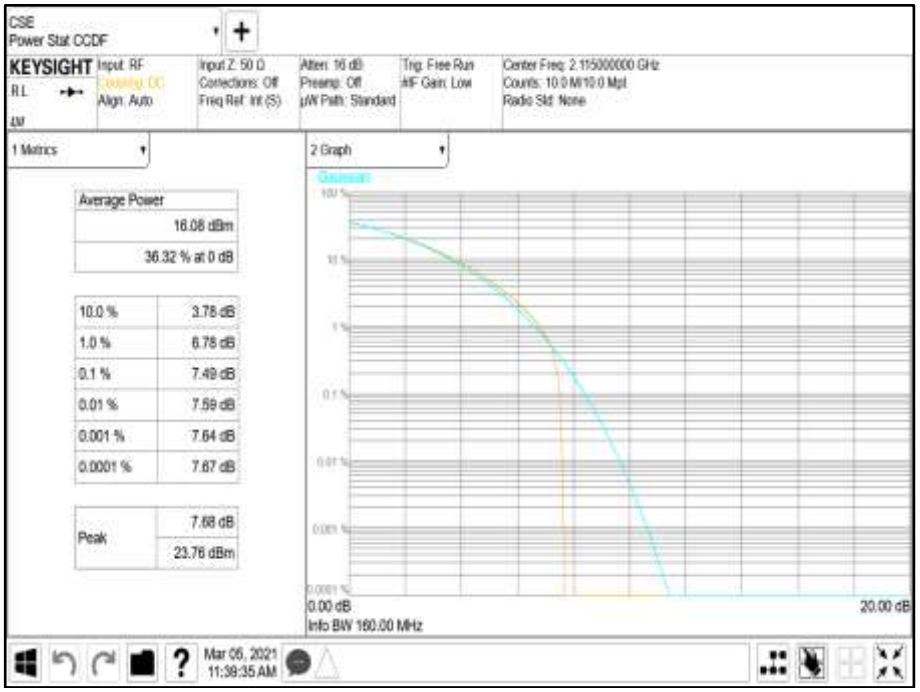


Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position B

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



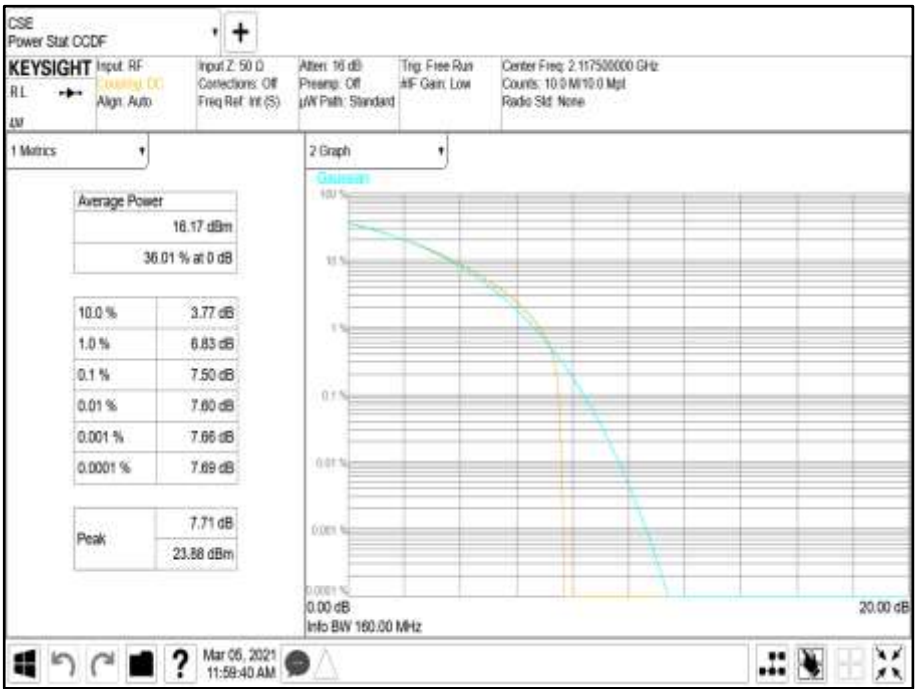
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B



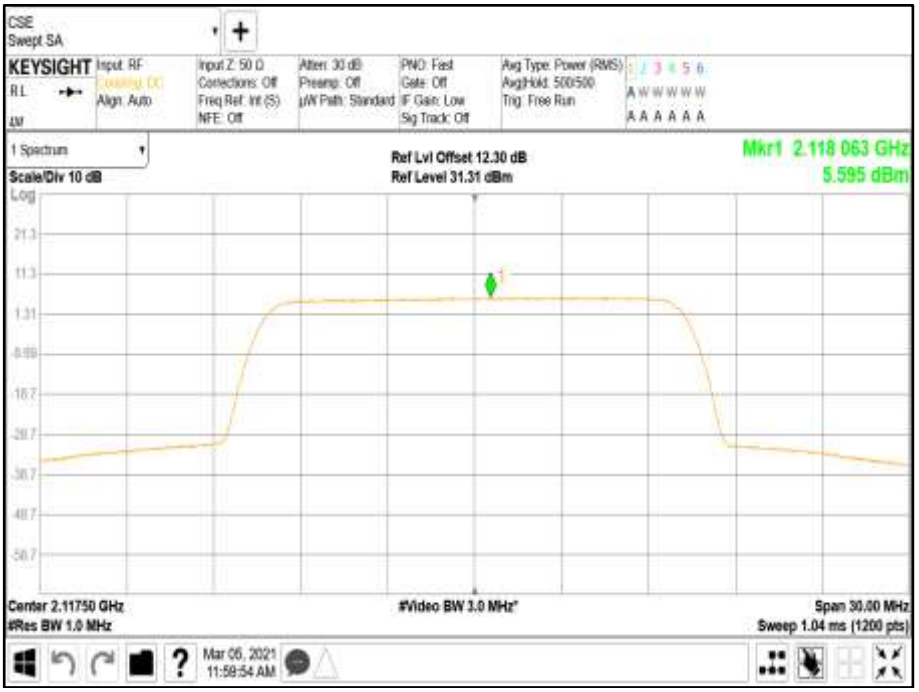
Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position B

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

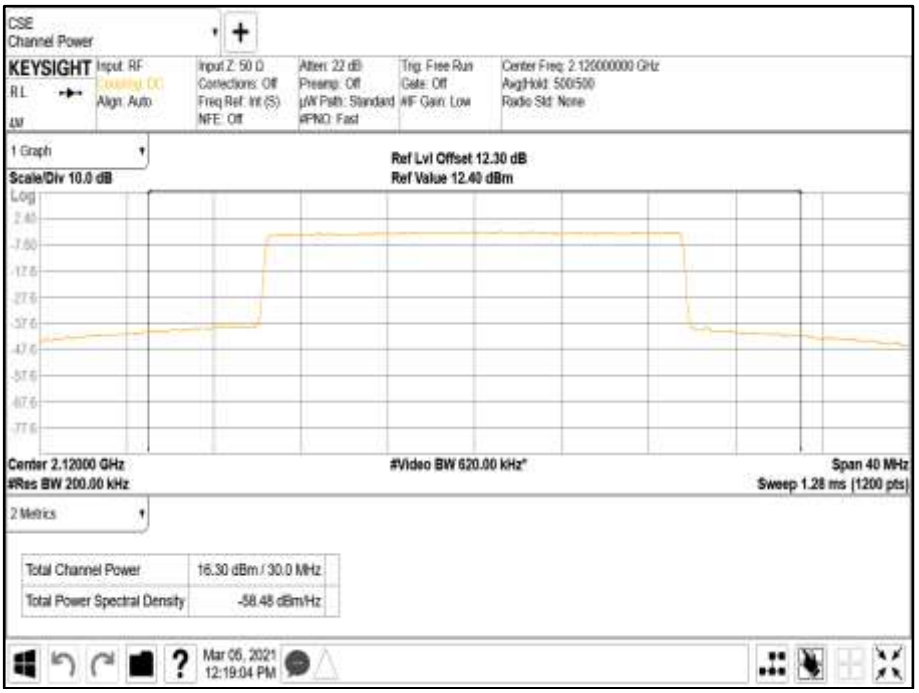
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



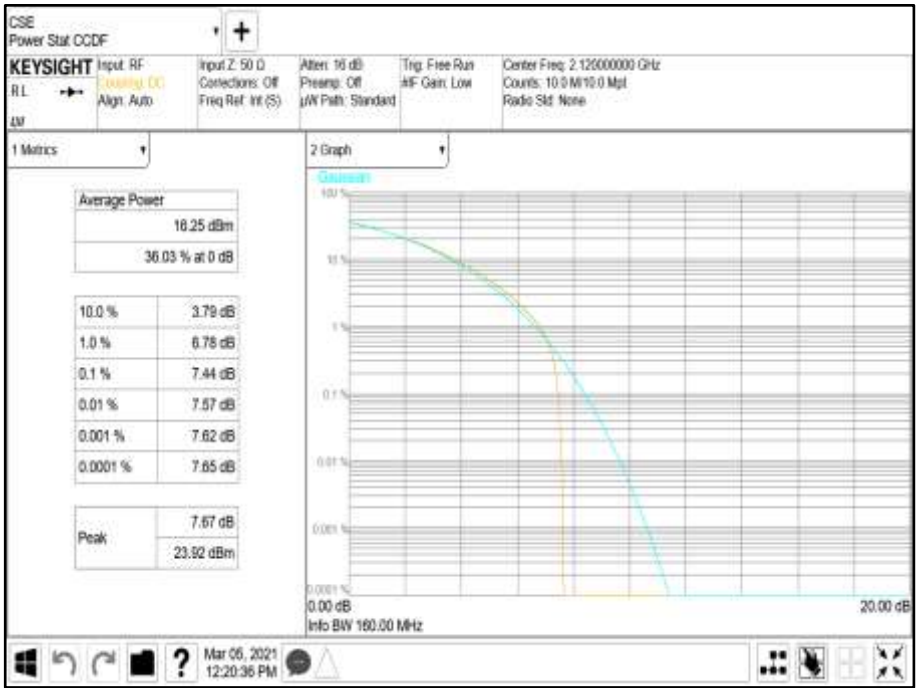
Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position B



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

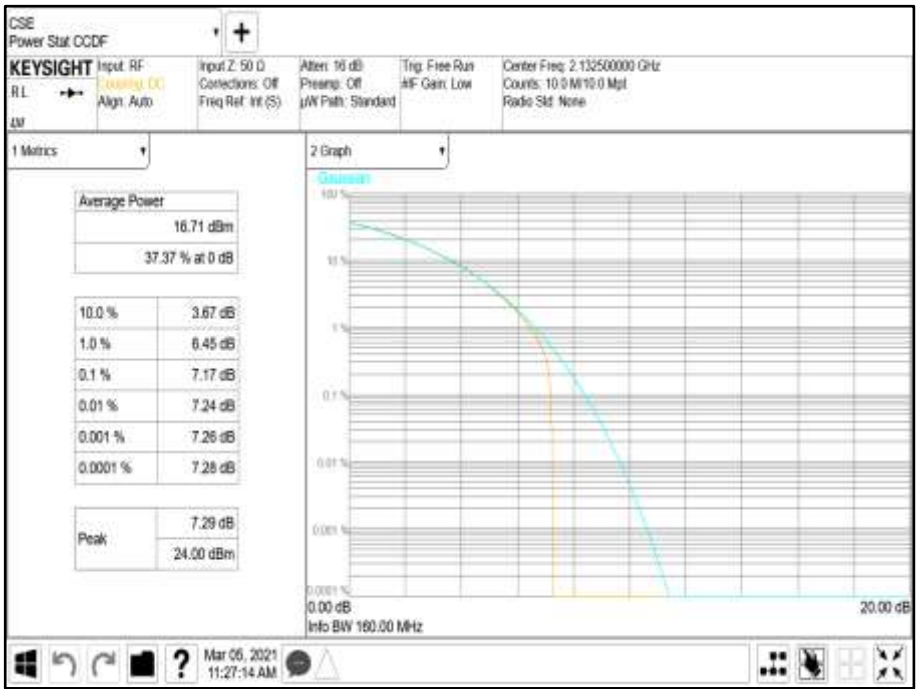
Configuration A

Maximum Output Power 17.00 dBm / Port

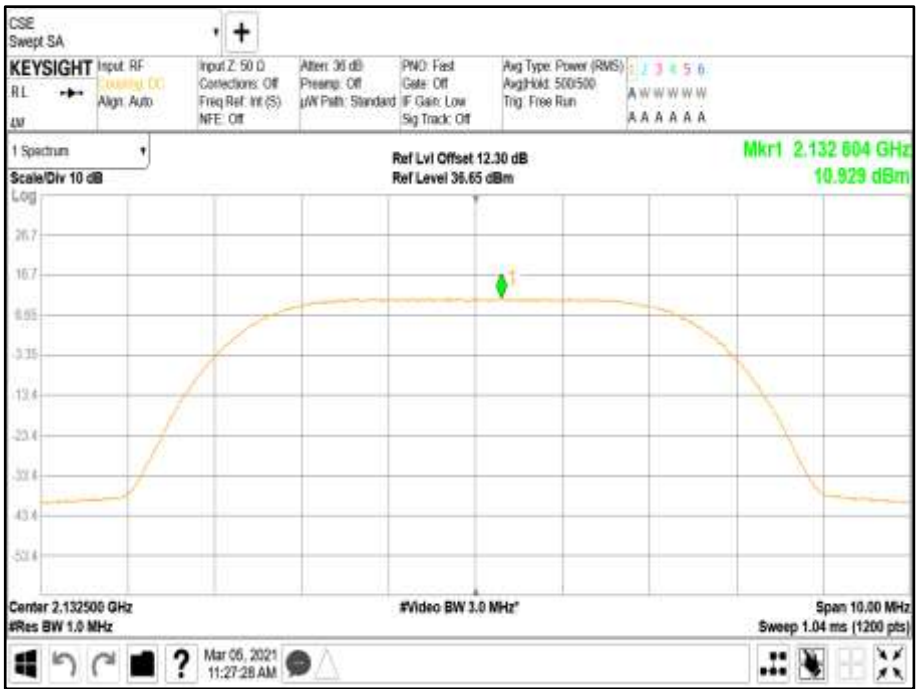
Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
			Channel Position M				
			PAR (dB)	Average Power			
				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz
A	NR: QPSK	5.0 MHz	7.29	16.50	19.00	10.93	13.43
B	NR: QPSK	5.0 MHz	-	16.73	19.23	10.93	13.43
Total			-	19.63	22.13	13.94	16.44
A	NR: QPSK	10.0 MHz	7.33	16.46	18.96	7.63	10.13
B	NR: QPSK	10.0 MHz	-	16.70	19.20	7.63	10.13
Total			-	19.59	22.09	10.64	13.14
A	NR: QPSK	15.0 MHz	7.55	16.34	18.84	5.78	8.28
B	NR: QPSK	15.0 MHz	-	16.60	19.10	5.78	8.28
Total			-	19.48	21.98	8.79	11.29
A	NR: QPSK	20.0 MHz	7.74	16.38	18.88	4.52	7.02
B	NR: QPSK	20.0 MHz	-	16.56	19.06	4.52	7.02
Total			-	19.48	21.98	7.53	10.03

Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M

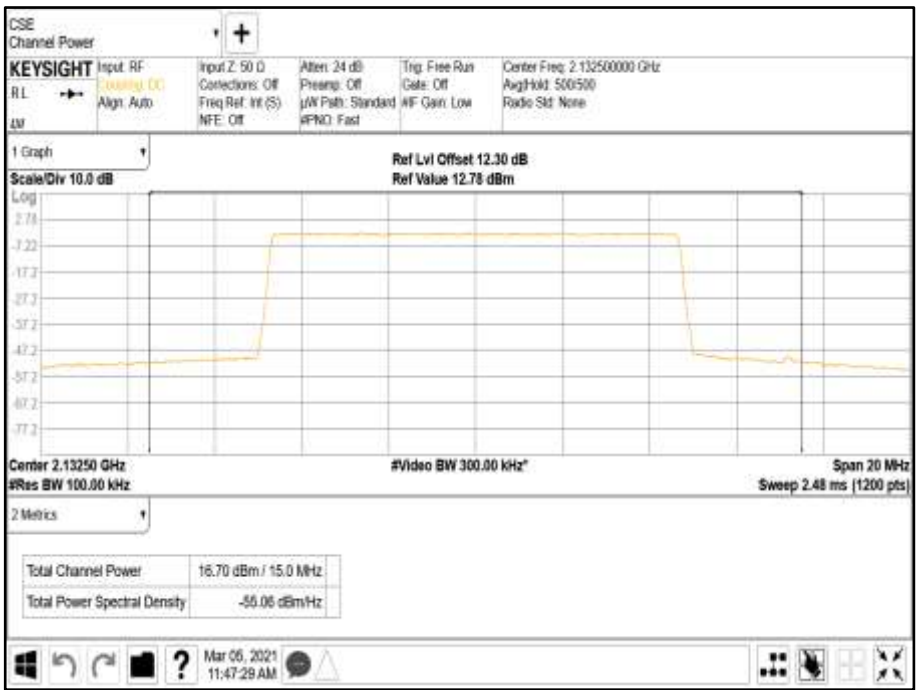
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M



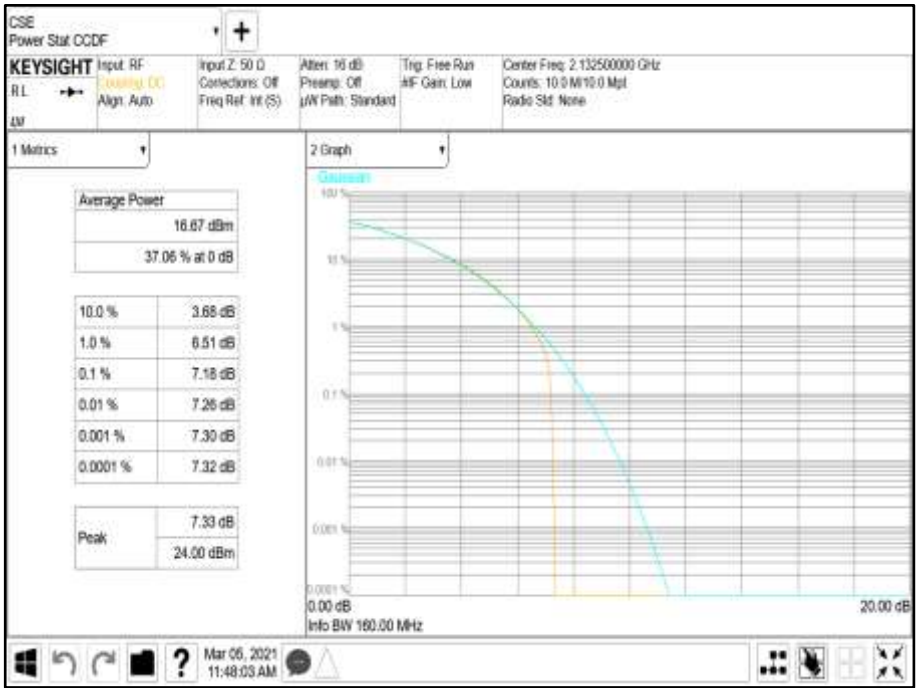
Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M



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



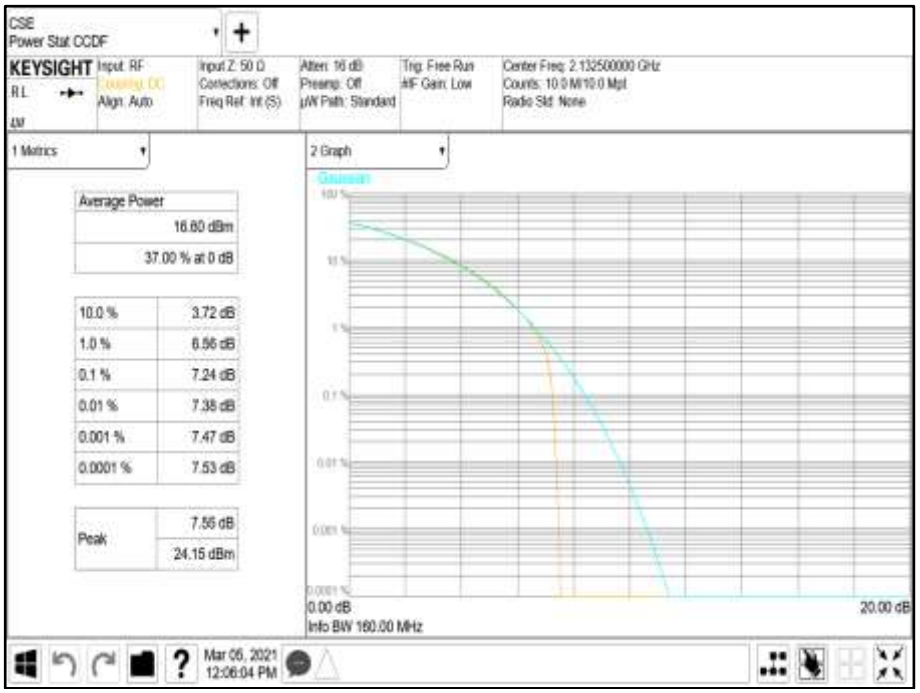
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position M



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

Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position M

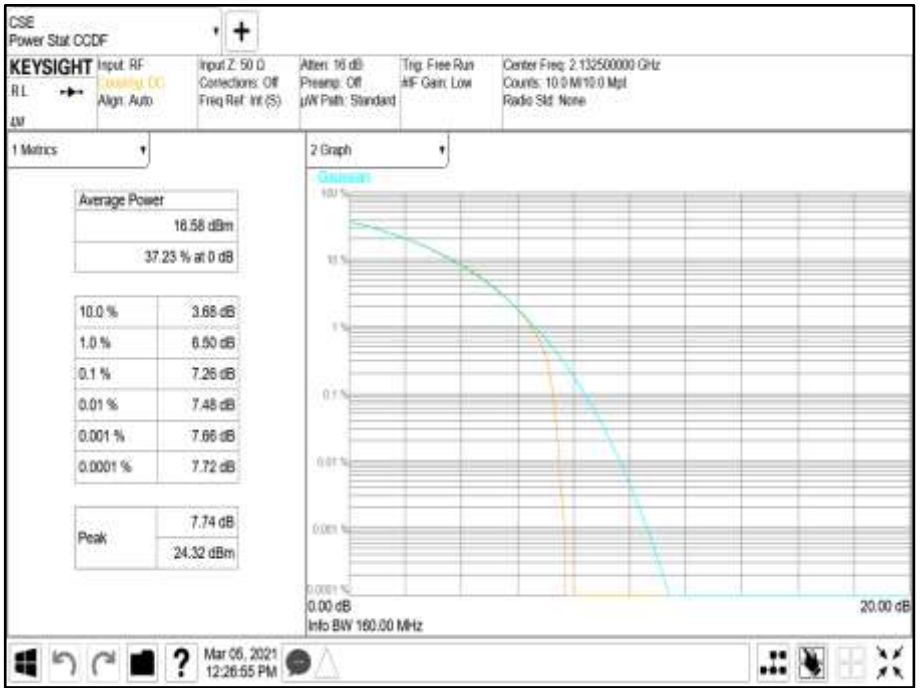
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position M



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position M

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

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



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

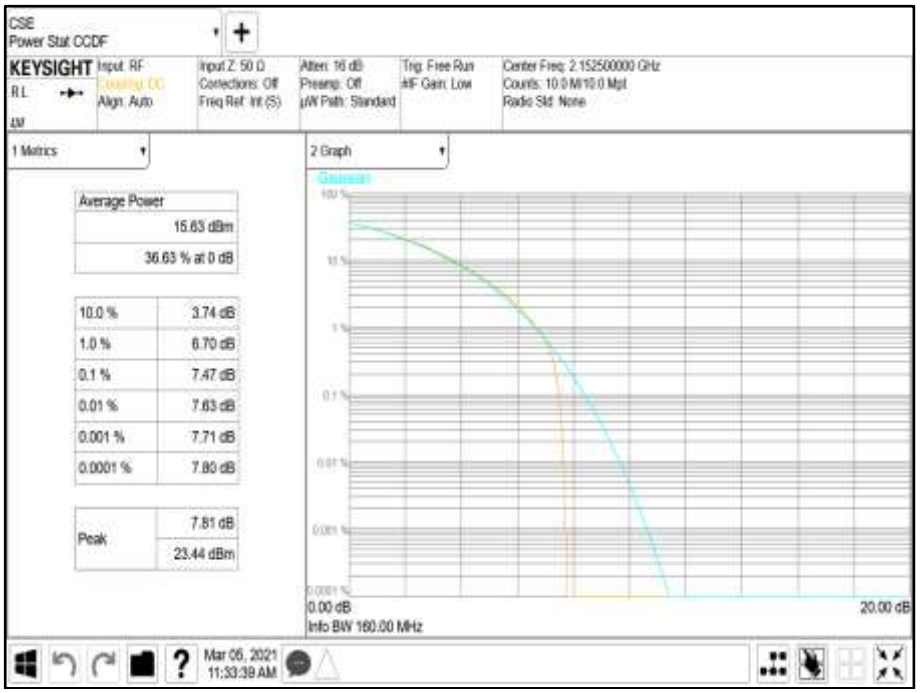
Configuration A

Maximum Output Power 17.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
			Channel Position T				
			PAR (dB)	Average Power			
				dBm	EIRP (dBm)	dBm/MHz	EIRP dBm/MHz
A	NR: QPSK	5.0 MHz	7.81	15.73	18.23	10.01	12.51
B	NR: QPSK	5.0 MHz	-	15.65	18.15	10.01	12.51
Total			-	18.70	21.20	13.02	15.52
A	NR: QPSK	10.0 MHz	7.98	15.99	18.49	7.50	10.00
B	NR: QPSK	10.0 MHz	-	16.11	18.61	7.50	10.00
Total			-	19.06	21.56	10.51	13.01
A	NR: QPSK	15.0 MHz	8.29	15.97	18.47	5.46	7.96
B	NR: QPSK	15.0 MHz	-	16.14	18.64	5.46	7.96
Total			-	19.07	21.57	8.47	10.97
A	NR: QPSK	20.0 MHz	8.72	16.12	18.62	4.30	6.80
B	NR: QPSK	20.0 MHz	-	16.31	18.81	4.30	6.80
Total			-	19.23	21.73	7.31	9.81

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

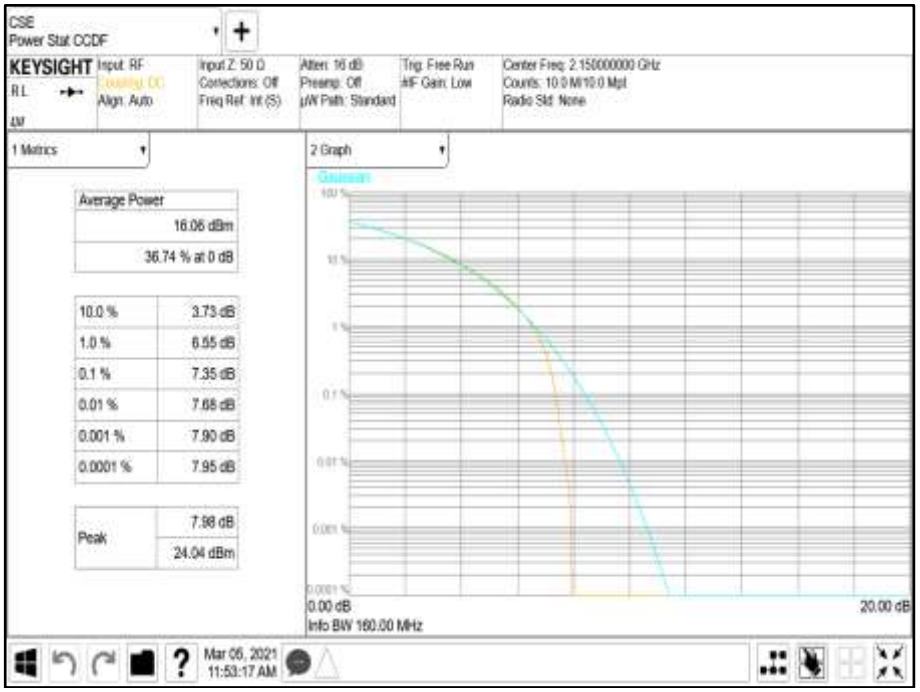
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position T



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

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

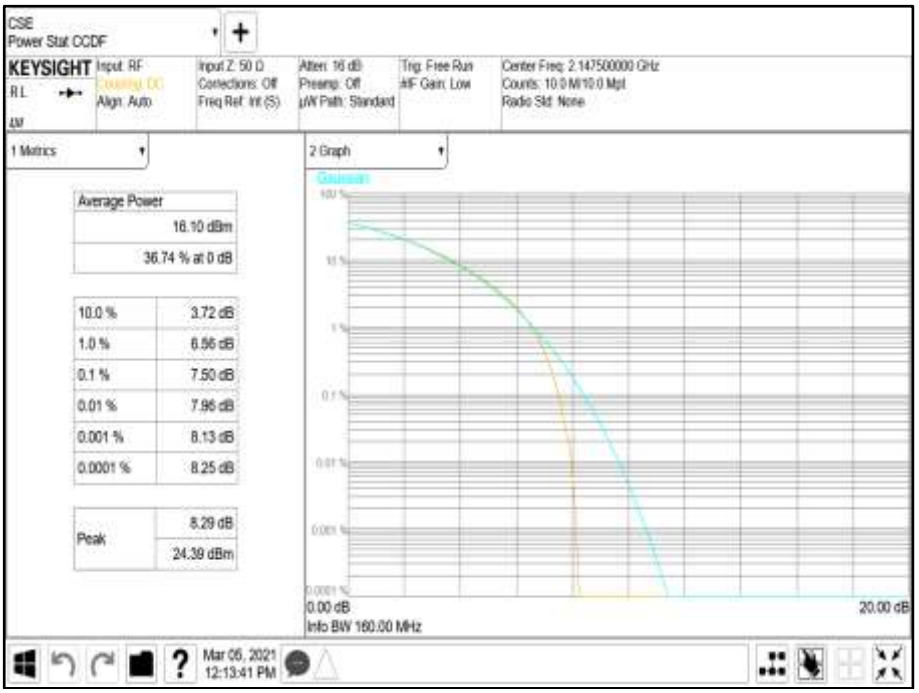
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 10.0 MHz - Channel Position T



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

Antenna Port A Carrier Power - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position T

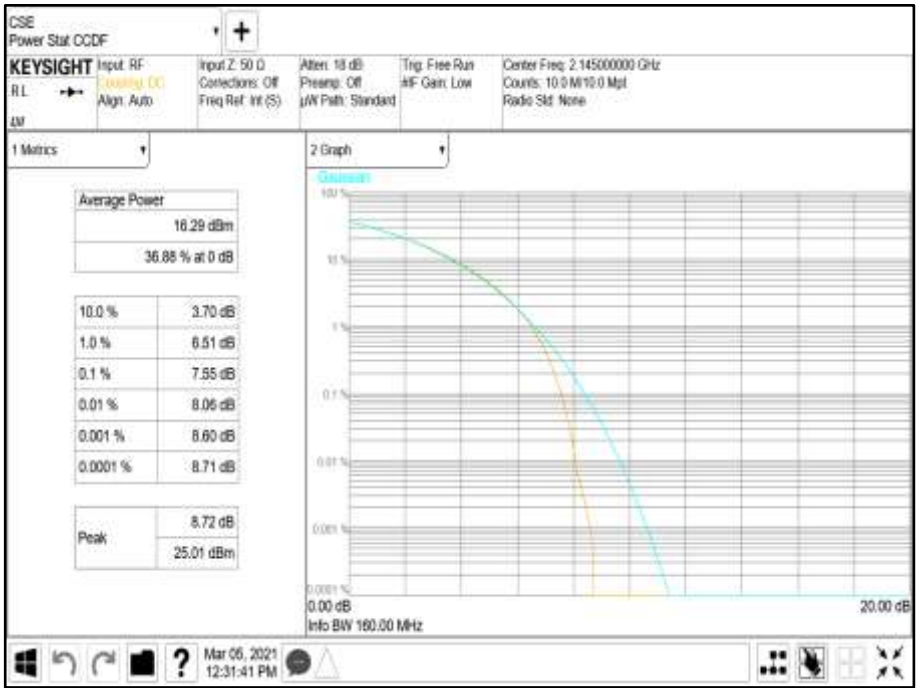
Antenna Port A Pk-Av Ratio - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position T



Antenna Port A PSD - Modulation NR: QPSK - Carrier Bandwidth 15.0 MHz - Channel Position T

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

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



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

Configuration B

Maximum Output Power 17.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	NR: QPSK	15.0+15.0 MHz	-	16.27	-
B	NR: QPSK	15.0+15.0 MHz	-	16.40	-
Total			-	19.35	-
A	NR: QPSK	20.0+20.0 MHz	-	16.22	-
B	NR: QPSK	20.0+20.0 MHz	-	16.33	-
Total			-	19.29	-
A	LTE + NR: QPSK	5.0+5.0 MHz	-	16.43	-
B	LTE + NR: QPSK	5.0+5.0 MHz	-	16.72	-
Total			-	19.59	-

Remarks

1. The plot results represent typical radio performace across all channels.
2. The 5 MHz channel bandwidth for LTE+NR is presented as the worst-case power configuration.
3. Plot data performance for all transmitter ports and channels are available on request.

Antenna A - Modulation NR: QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position M

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

Antenna A - Modulation LTE+NR: QPSK - Carrier Bandwidth 5.0+5.0 MHz - Channel Position M

Configuration C

Maximum Output Power 17.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	NR: QPSK	5.0+5.0+5.0+5.0 MHz	-	16.39	-
B	NR: QPSK	5.0+5.0+5.0+5.0 MHz	-	16.65	-
Total			-	19.53	-
A	NR: QPSK	10.0+10.0+10.0+10.0 MHz	-	16.30	-
B	NR: QPSK	10.0+10.0+10.0+10.0 MHz	-	16.42	-
Total			-	19.37	-

Remarks

1. The plot results represent typical radio performace across the transmit pass band.
2. The highest power transmitter configuration is presented for compliance.

Antenna A - Modulation NR: QPSK - Carrier Bandwidth 5.0+5.0+5.0+5.0 MHz - Channel Position M

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

Limit	
Peak Power	≤ 1640 W/MHz or ≤+62.15 dBm RSS-139 1710-1780 MHz ≤ 1W RSS-139 2110-2180MHz ≤ 1640 W/MHz or ≤+62.15 dBm

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 27, Clause 27.53
ISED RSS-GEN, Clause 6.7

2.2.2 Date of Test and Modification State

24 February 2021 - 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	24.9°C
Relative Humidity	29.8%

2.2.5 Test Method

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

2.2.6 Test Results

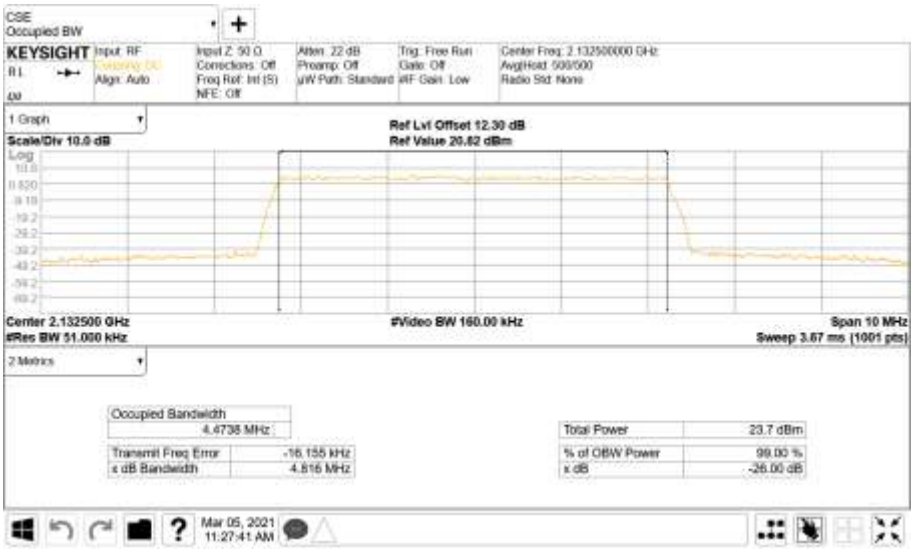
Configuration A

Maximum Output Power 17.00 dBm / Port

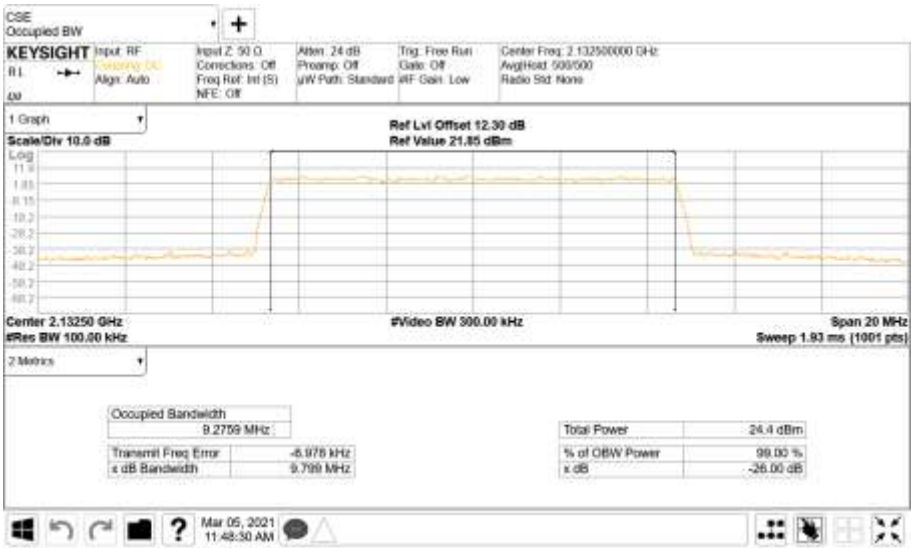
Antenna	Modulation	Carrier Bandwidth	Result (MHz)	
			Channel Bandwidth	
			Occupied Bandwidth	-26 dB Bandwidth
A	NR: QPSK	NR: 5.0 MHz	4.47	4.82
A	NR: QPSK	NR: 10.0 MHz	9.28	9.80
A	NR: QPSK	NR: 15.0 MHz	14.09	14.75
A	NR: QPSK	NR: 20.0 MHz	18.91	19.64

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

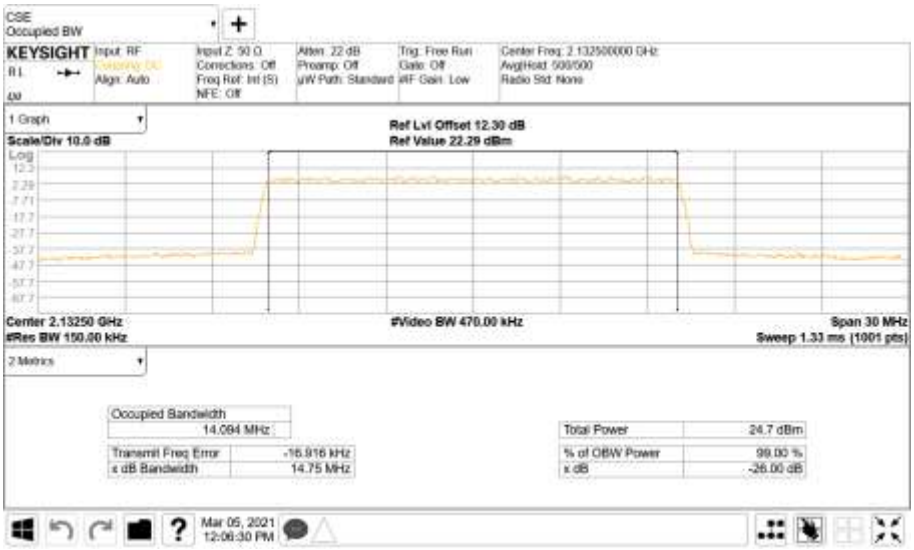
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position M



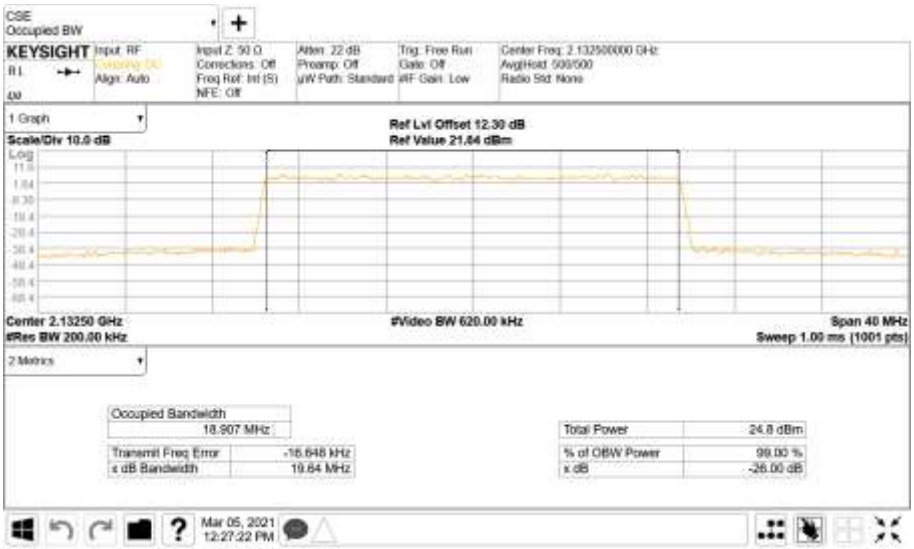
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position M



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051
FCC CFR 47 Part 27, Clause 27.53 (h)
ISED RSS-139, Clause 6.6

2.3.2 Date of Test and Modification State

24 February 2021 - Modification State 0

2.3.1 Test Equipment Used

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

2.3.2 Environmental Conditions

Ambient Temperature	24.9°C
Relative Humidity	29.8%

2.3.3 Test Method

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

The EUT has 2 transmit ports, therefore, the test limits used were calculated on a worst-case basis accounting for an effective 2 port MIMO configuration. Testing was performed on this port with a test limit of 43+10log(P) - 10log (2) = -16 dBm

2.3.4 Test Results

Configuration A

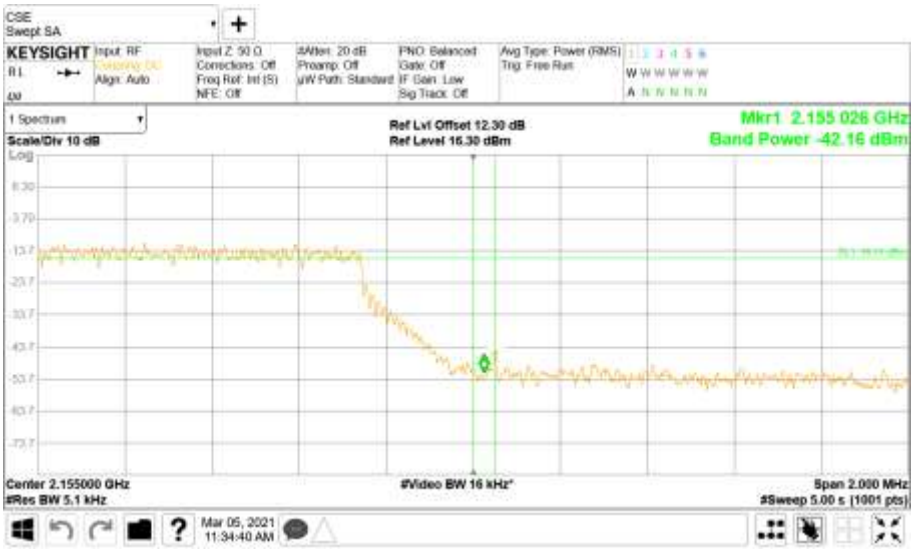
Maximum Output Power 17.00 dBm / Port

Antenna	NR Modulation	NR Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	NR: QPSK	NR: 5.0 MHz	2,112.5	2,152.5
A	NR: QPSK	NR: 10.0 MHz	2,115.0	2,150.0
A	NR: QPSK	NR: 15.0 MHz	2,117.5	2,147.5
A	NR: QPSK	NR: 20.0 MHz	2,120.0	2,145.0

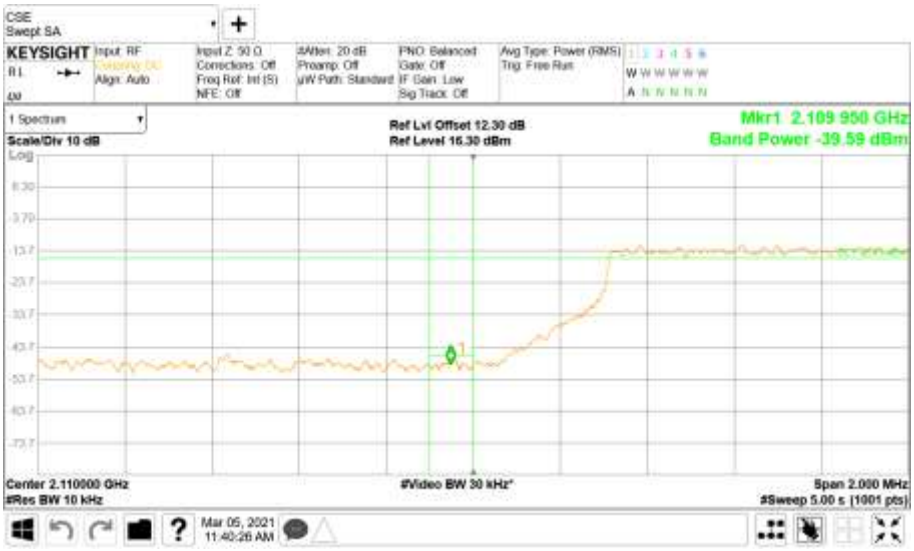
Remarks
1. Band edge data was captured from the transmit port with maximum measured power.
2. Worst case band edge data presented.

Modulation NR: QPSK - Carrier Bandwidth NR: 5.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 5.0 MHz - Channel Position T



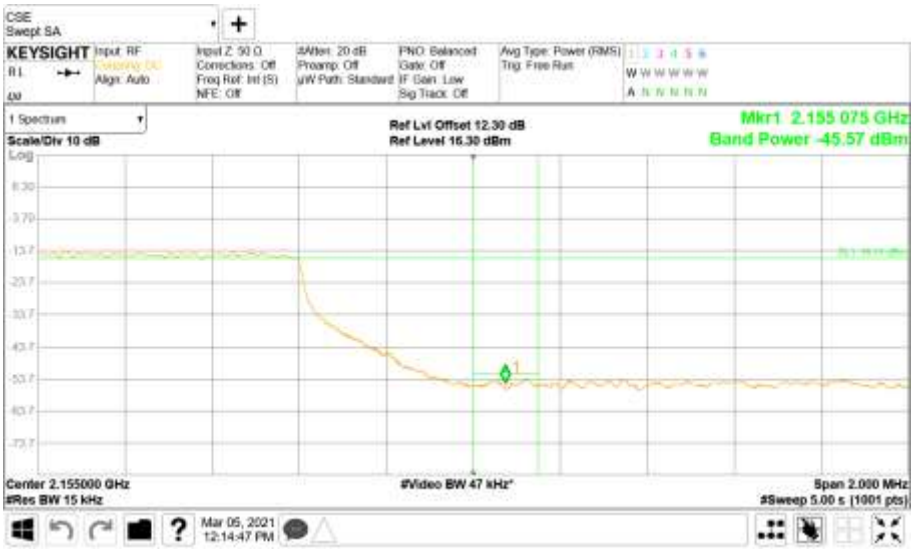
Modulation NR: QPSK - Carrier Bandwidth NR: 10.0 MHz - Channel Position B



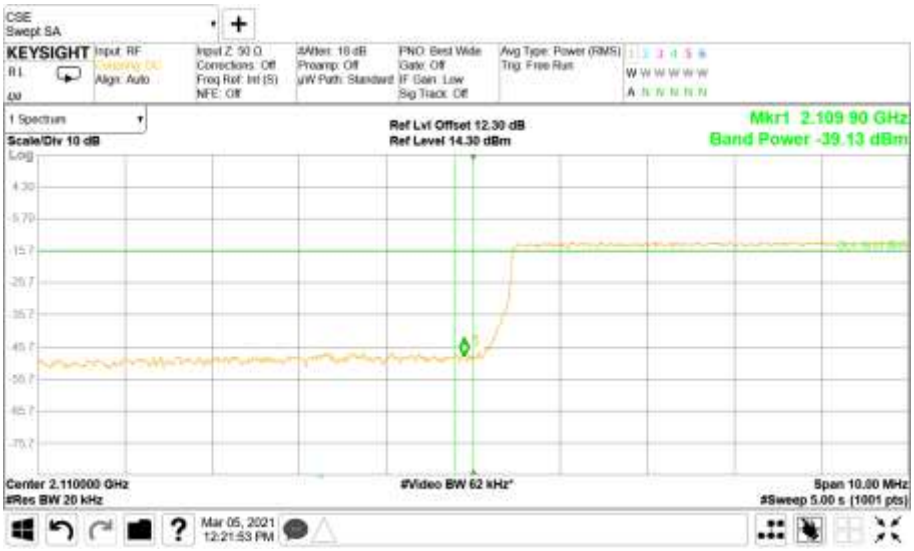
Modulation NR: QPSK - Carrier Bandwidth NR: 10.0 MHz - Channel Position T

Modulation NR: QPSK - Carrier Bandwidth NR: 15.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 15.0 MHz - Channel Position T



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



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

Configuration B

Maximum Output Power 17.00 dBm / Port

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	NR: QPSK	15.0+15.0 MHz	2117.5+2125.0	2140.0+2147.5
A	NR: QPSK	20.0+20.0 MHz	2120.0+2140.0	2125.0+2145.0
A	LTE + NR: QPSK	5.0+5.0 MHz	2112.5+2117.5	2147.5+2152.5

Remarks

The plot results represent typical radio performance. Plot data performance for all transmitter ports and channels are on file and available on request.

Modulation NR: QPSK - Carrier Bandwidth NR: 15..0 +15.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 15..0 +15.0 MHz - Channel Position T

Modulation NR: QPSK - Carrier Bandwidth NR: 20..0 +20.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 20..0 +20.0 MHz - Channel Position T

Modulation LTE+NR: QPSK - Carrier Bandwidth LTE+NR: 5..0 +5.0 MHz - Channel Position B

Modulation LTE+NR: QPSK - Carrier Bandwidth LTE+NR: 5..0 +5.0 MHz - Channel Position T

Configuration C

Maximum Output Power 17 dBm

Antenna	Modulation	Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	NR: QPSK	5.0+5.0+5.0+5.0 MHz	2112.5+2117.5+2122.5+2127.5	2137.5+2142.5+2147.5+2152.5
A	NR: QPSK	10.0+10.0+10.0+10.0 MHz	2115.0+2125.0+2135.0+2145.0	2120.0+2130.0+2140.0+2150.0

Remarks

The plot results represent typical radio performance. Plot data performance for all transmitter ports and channels are on file and available on request.

Modulation NR: QPSK - Carrier Bandwidth NR: 5.0+5.0+5..0 +5.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 5.0+5.0+5..0 +5.0 MHz - Channel Position T

Modulation NR: QPSK - Carrier Bandwidth NR: 10.0+10.0+10..0 +10.0 MHz - Channel Position B

Modulation NR: QPSK - Carrier Bandwidth NR: 10.0+10.0+10..0 +10.0 MHz - Channel Position T

Limit	-16dBm

2.4 TRANSCEIVER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53 (h)
Industry Canada RSS-139, Clause 6.6
FCC CFR 47 Part 2, Clause 2.1051

2.4.2 Date of Test and Modification State

24 February 2021 - 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	24.9°C
Relative Humidity	29.8%

2.4.5 Test Method

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

The EUT has 2 transmit ports, therefore, the test limits used were
calculated on a worst-case basis accounting for an effective 2 port MIMO configuration. Testing was performed on this port with a test limit of 43+10log(P) - 10log (2) = -16 dBm

2.4.6 Test Results

Configuration A

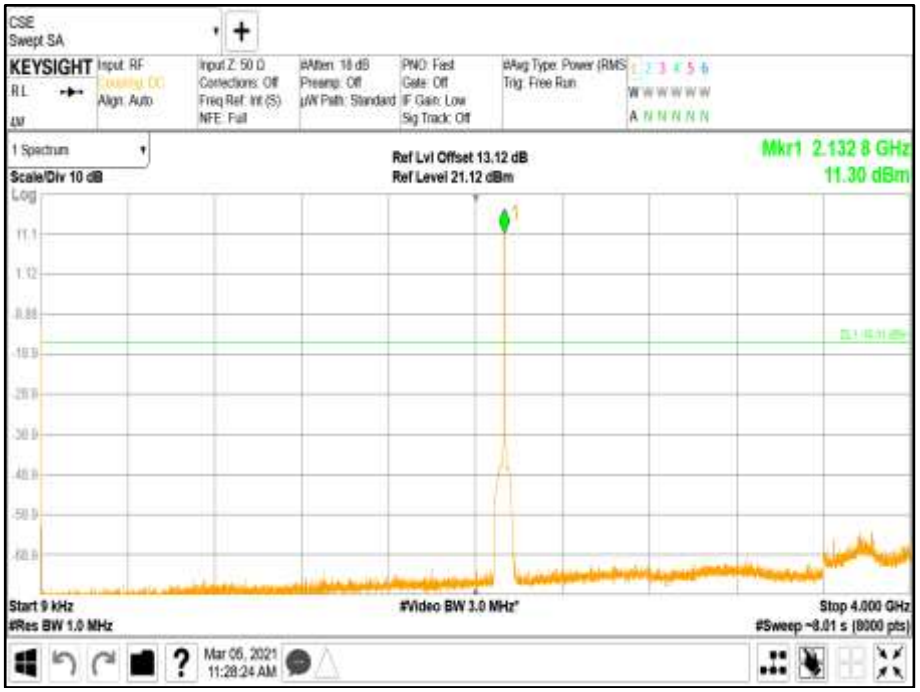
Maximum Output Power 17.00 dBm / Port

Modulation	Carrier Bandwidth	Channel Position	Band	Range
NR: QPSK	5.0 MHz	M	1	0.009 to 4000 MHz
NR: QPSK	5.0 MHz	M	2	4000 to 12000 MHz
NR: QPSK	5.0 MHz	M	3	12000 to 18000 MHz
NR: QPSK	5.0 MHz	M	4	18000 to 22000 MHz

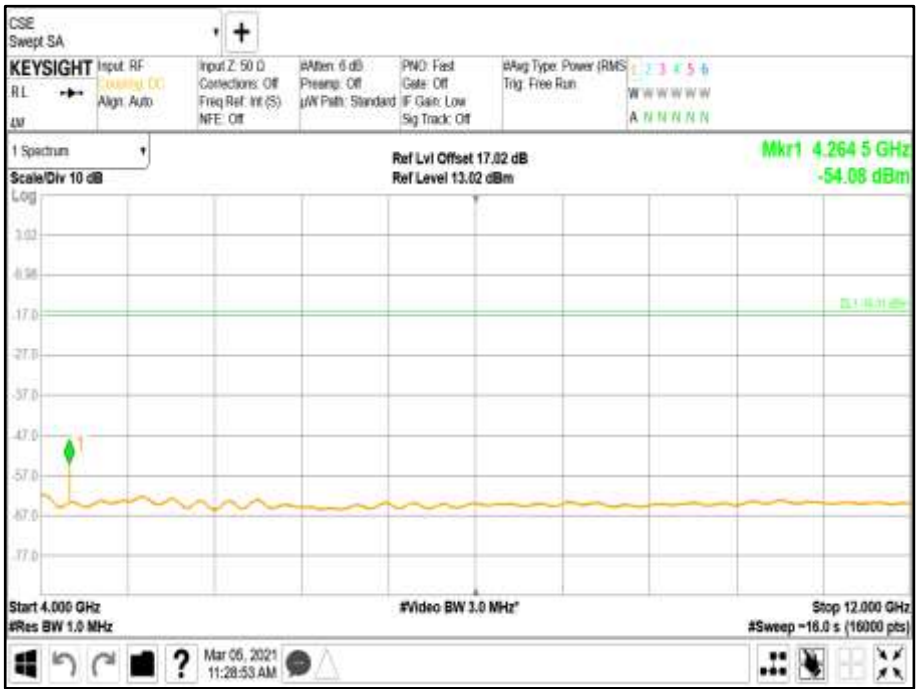
Remarks

1. Transceiver spurious emssions have been searched for all channel bandwidths and antenna ports.
2. Representavie spurious emissions performance has been presented for all modulations.
3. Plot data performance for all transmitter ports, channel bandwidths, and channel positions are on file and available on request.

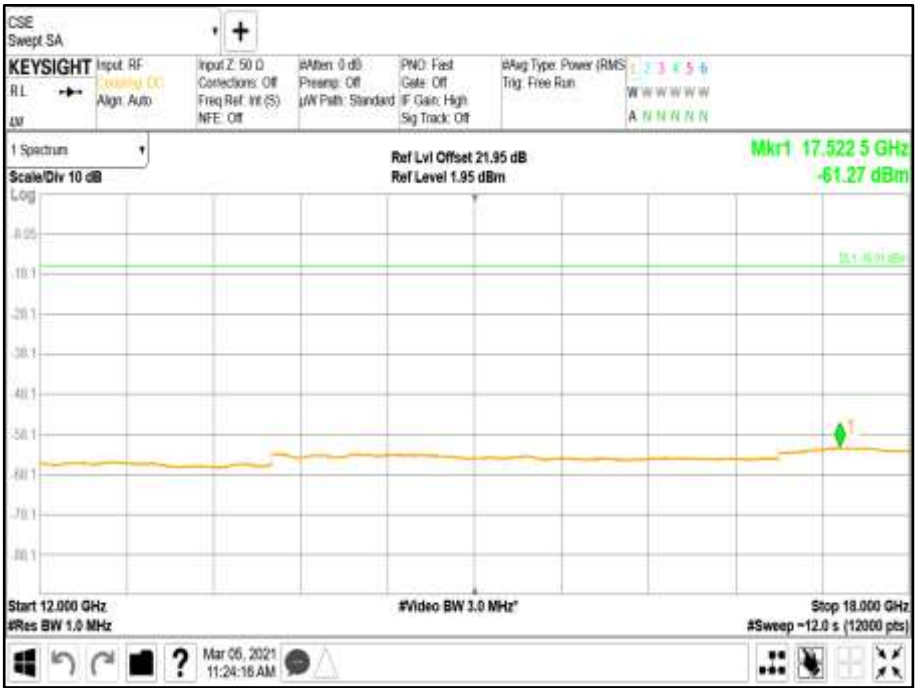
Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M - Band 1.00 - Range 0.009 to 4000 MHz



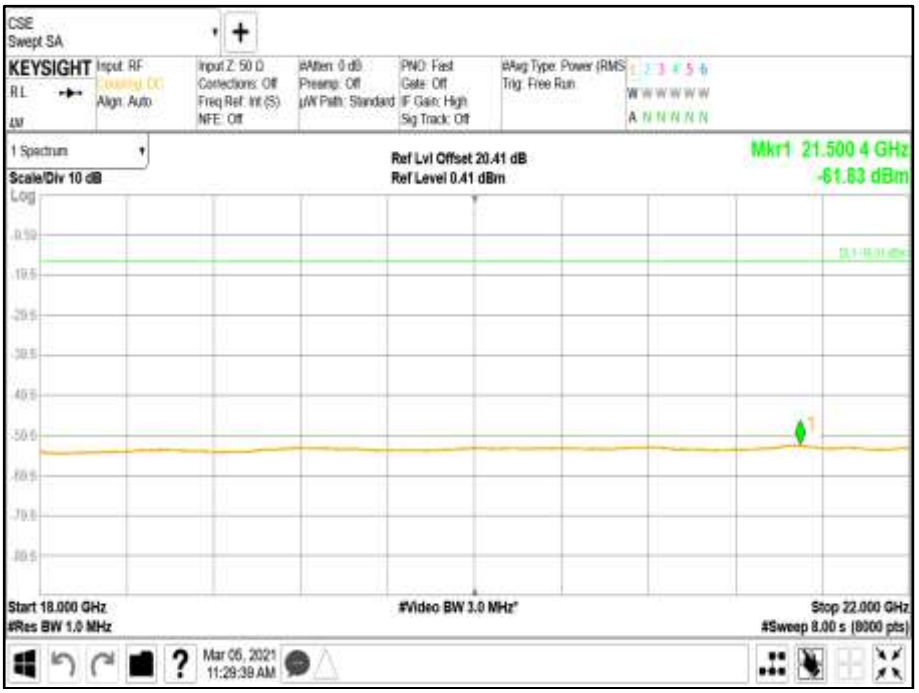
Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M - Band 2 - Range 4000 to 12000 MHz



Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



Modulation NR: QPSK - Carrier Bandwidth 5.0 MHz - Channel Position M - Band 4 - Range 18000 to 22000 MHz



Configuration B

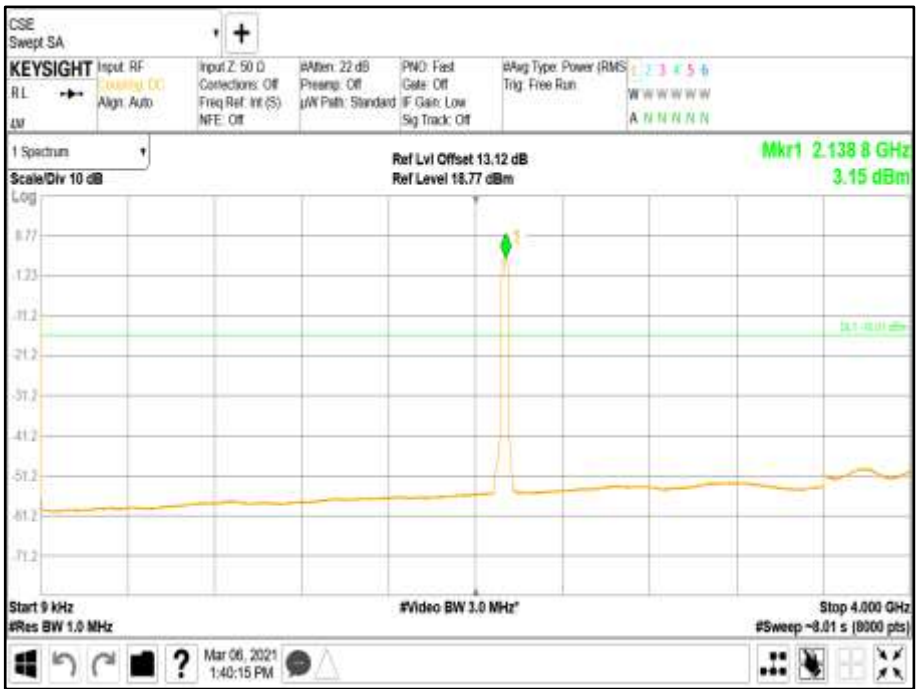
Maximum Output Power 17.00 dBm / Port

Modulation	Carrier Bandwidth	Channel Position	Band	Range
NR QPSK	15.0+15.0 MHz	M	1	0.009 to 4000 MHz
NR QPSK	15.0+15.0 MHz	M	2	4000 t0 12000 MHz
NR QPSK	15.0+15.0 MHz	M	3	12000to 18000 MHz
NR QPSK	15.0+15.0 MHz	M	4	18000to 22000 MHz
LTE + NR QPSK	5.0+5.0 MHz	M	1	0.009 to 4000 MHz
LTE + NR QPSK	5.0+5.0 MHz	M	2	4000 t0 12000 MHz
LTE + NR QPSK	5.0+5.0 MHz	M	3	12000to 18000 MHz
LTE + NR QPSK	5.0+5.0 MHz	M	4	18000to 22000 MHz

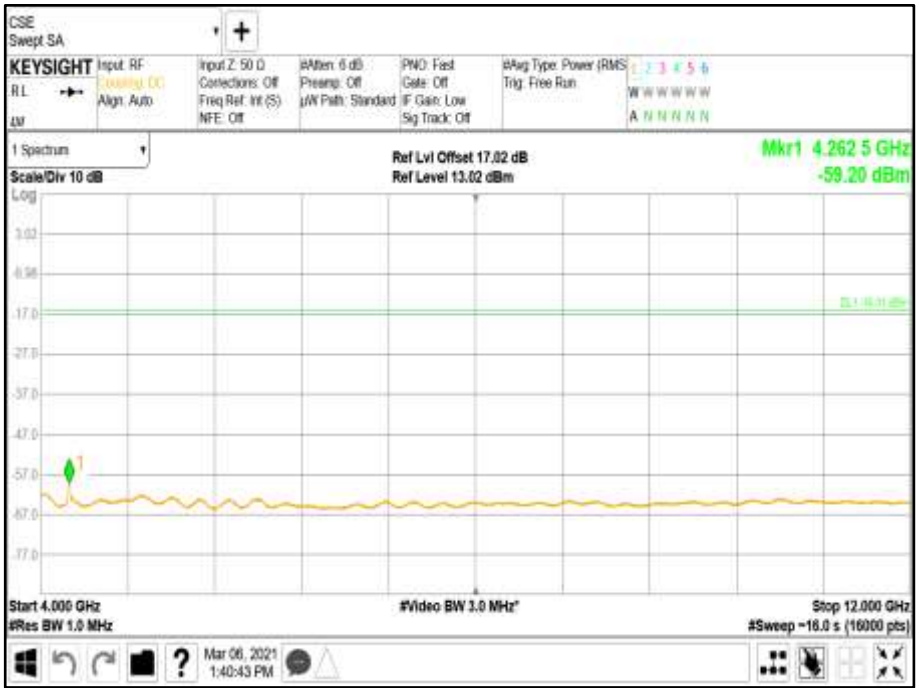
Remarks

1. Transceiver spurious emssions have been searched for all channel bandwidths and antenna ports.
2. Representavie spurious emissions performance has been presented for all modulations.
3. Plot data performance for all transmitter ports, channel bandwidths, and channel positions are on file and available on request.

Modulation NR QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position M - Band 1.00 - Range 0.009 to 4000 MHz

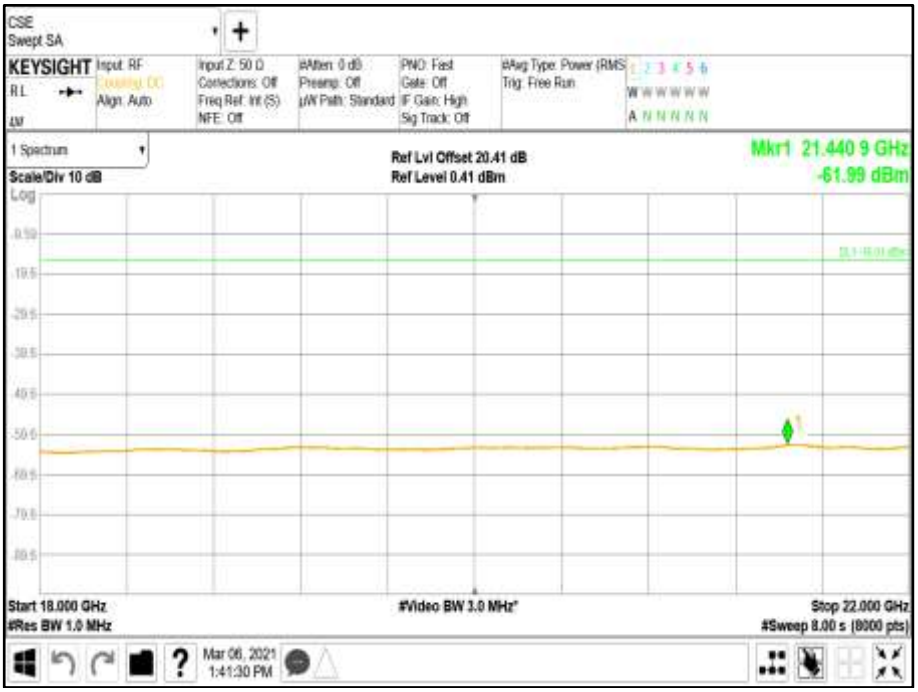


Modulation NR QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position M - Band 2 - Range 4000 t0 12000 MHz



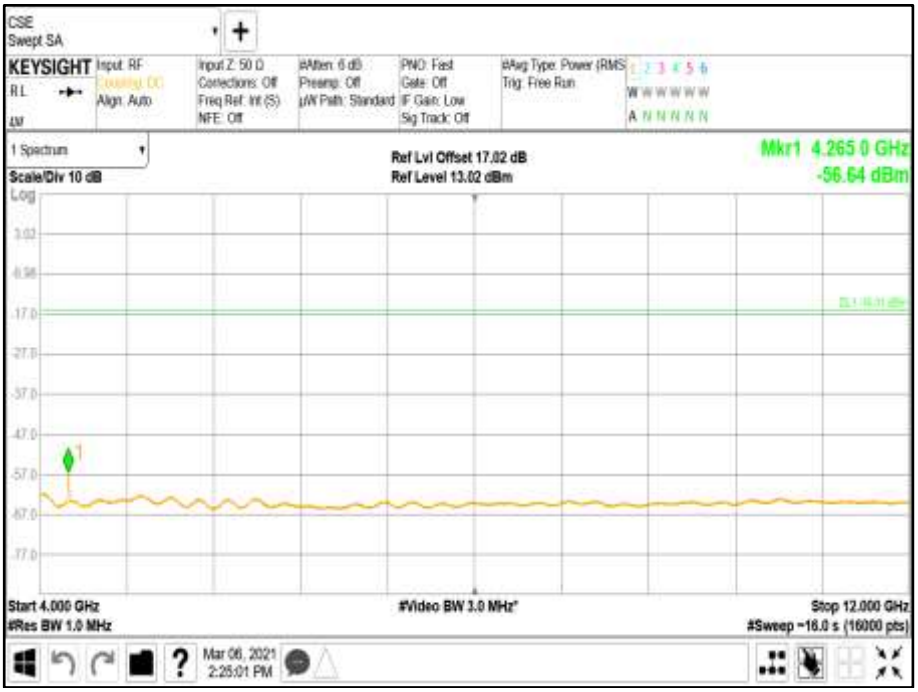
Modulation NR QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position M - Band 3 - Range 12000to 18000 MHz

Modulation NR QPSK - Carrier Bandwidth 15.0+15.0 MHz - Channel Position M - Band 4 - Range 18000to 22000 MHz

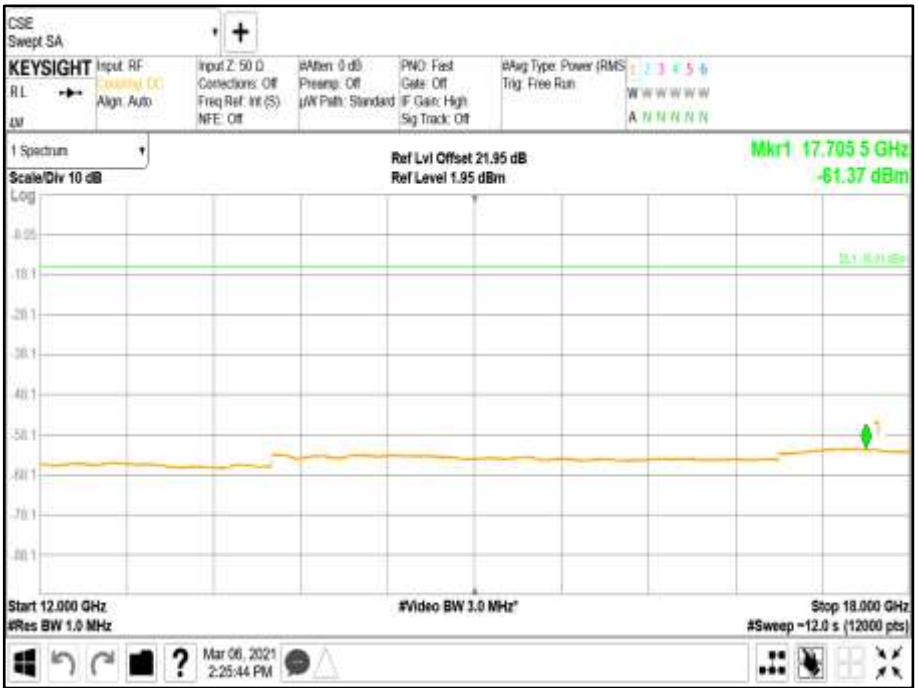


Modulation LTE + NR QPSK - Carrier Bandwidth 5.0+5.0 MHz - Channel Position M - Band 1.00 - Range 0.009 to 4000 MHz

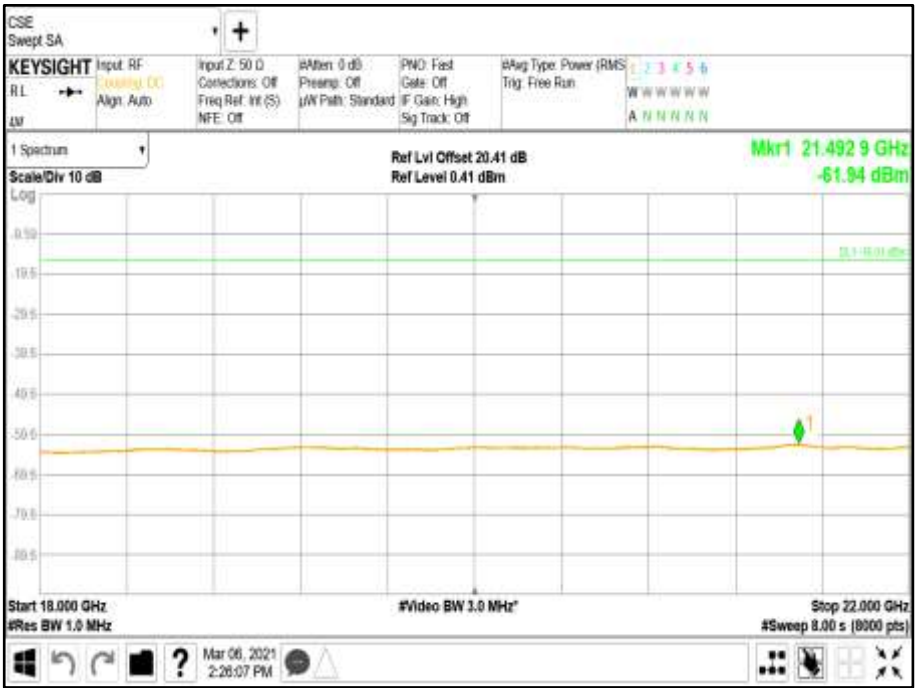
Modulation LTE + NR QPSK - Carrier Bandwidth 5.0+5.0 MHz - Channel Position M - Band 2 - Range 4000 t0 12000 MHz



Modulation LTE + NR QPSK - Carrier Bandwidth 5.0+5.0 MHz - Channel Position M - Band 3 - Range 12000to 18000 MHz



Modulation LTE + NR QPSK - Carrier Bandwidth 5.0+5.0 MHz - Channel Position M - Band 4 - Range 18000to 22000 MHz



Configuration C

Maximum Output Power 17.00 dBm / Port

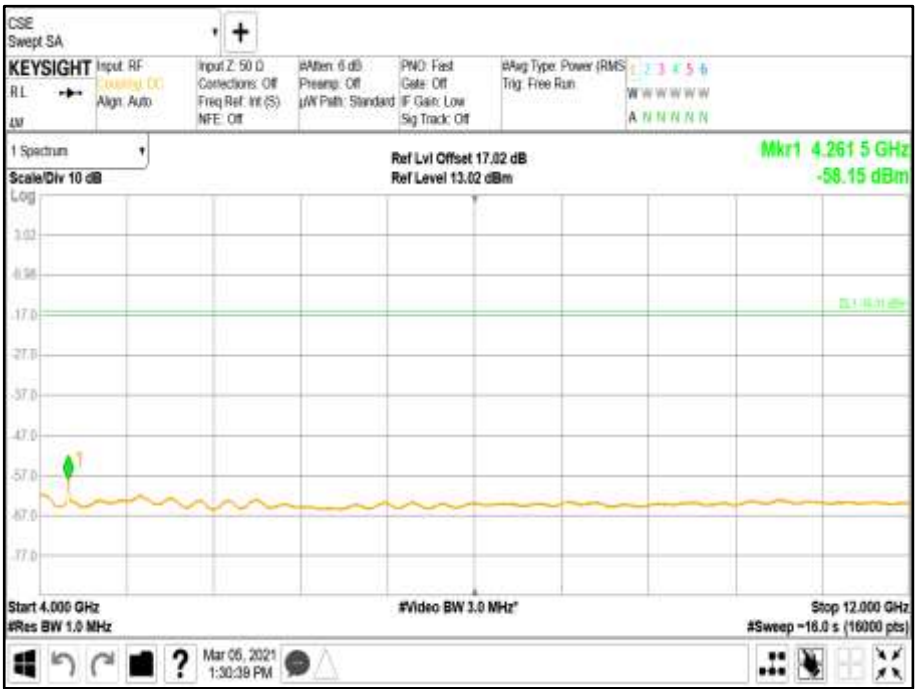
Modulation	Carrier Bandwidth	Channel Position	Band	Range
NR: QPSK	5.0+5.0+5.0+5.0 MHz	M	1	0.009 to 4000 MHz
NR: QPSK	5.0+5.0+5.0+5.0 MHz	M	2	4000 to 12000 MHz
NR: QPSK	5.0+5.0+5.0+5.0 MHz	M	3	12000 to 18000 MHz
NR: QPSK	5.0+5.0+5.0+5.0 MHz	M	4	18000 to 22000 MHz

Remarks

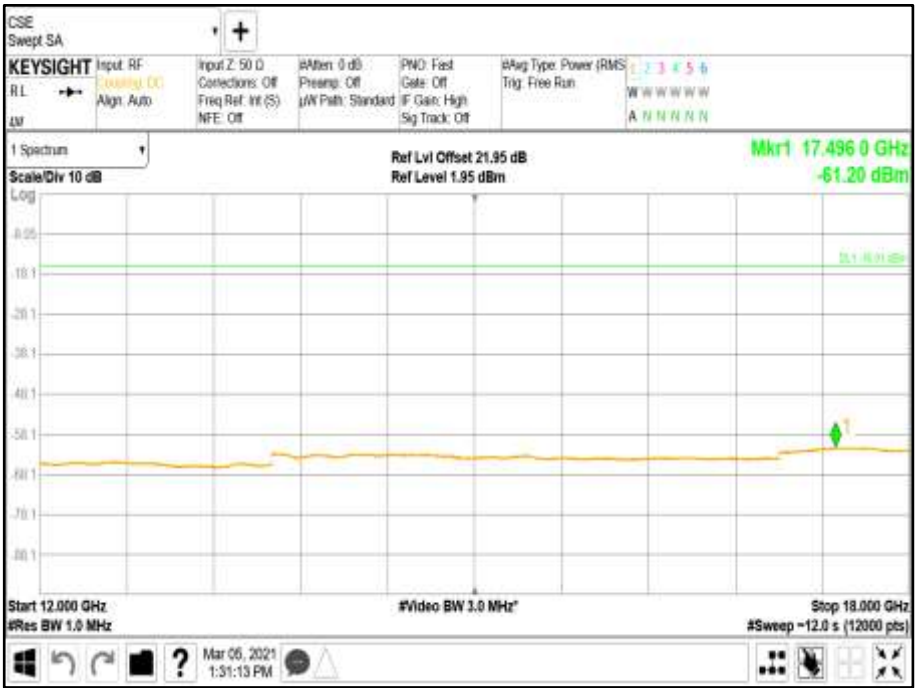
1. Transceiver spurious emssions have been searched for all channel bandwidths and antenna ports. 2. Representavie spurious emissions performance has been presented for all modulations. 3. Plot data performance for all transmitter ports, channel bandwidths, and channel positions are on file and available on request.

Modulation NR: QPSK - Carrier Bandwidth 5.0+5.0+5.0+5.0 MHz - Channel Position M - Band 1.00 - Range 0.009 to 4000 MHz

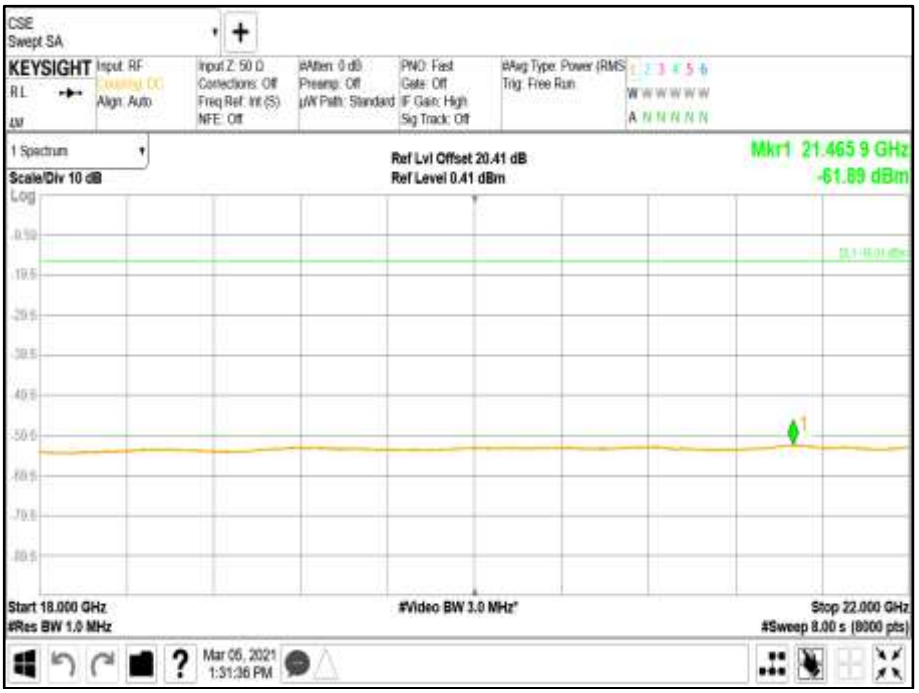
Modulation NR: QPSK - Carrier Bandwidth 5.0+5.0+5.0+5.0 MHz - Channel Position M - Band 2.00 - Range 4000 to 12000 MHz



Modulation NR: QPSK - Carrier Bandwidth 5.0+5.0+5.0+5.0 MHz - Channel Position M - Band 3 - Range 12000 to 18000 MHz



Modulation NR: QPSK - Carrier Bandwidth 5.0+5.0+5.0+5.0 MHz - Channel Position M - Band 4 - Range 18000 to 22000 MHz



Limit	-16dBm

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	24	24/04/2022
Thermometer	VWR	61161-364	192595396.00	24	25-10-2021
PSU	Xantrex	XKW60-50	E00109862	-	O/P Mon
Attenuator (10dB)	Mini-Circuits	BW-K10-2W44+	-	-	O/P Mon
RF Switch	Ericsson	RARSFW 4x1	1.00	-	O/P Mon
Switching Control Unit	HP	11713A	3748A060876	-	O/P Mon
Climate Chamber	Burnsco	RTC-37P-3-3	-07-07	-	O/P Mon

N/A – Not Applicable
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 decision rule according to IEC Guide 115: 2007, clause 4.4.3 and 4.5.1.

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Testing Laboratory
Certificate #2955.19

This report does not imply product endorsement by any government, accreditation agency, or TÜV SÜD Canada Inc.

Opinions or interpretations expressed in this report, if any, are outside the scope of TÜV SÜD Canada Inc. accreditations. Any opinions expressed do not necessarily reflect the opinions of TÜV SÜD Canada Inc., unless otherwise stated.

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

ANNEX A

MODULE LIST

Configurations A, B & C			
Product	Product No	R-State	Serial No
CT11	LPC 102 494/1	R2A	T01G495060
SUP 6601	1/BFL 901 009/1	R3B	BR81278870
IRU 2242	KRC 161 444/2	R2A	C829960688
RD 2242 B4 (EUT)	KRY 901 309/1	R2A	C828676641
Software Version:	CXP9013268/14	Revision:	R80BY