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Report On

FCC and ISED Testing of the
Ericsson NR KRC 161 652/1 Radio 2212 B5 (850 MHz) Base Station in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 22, Industry Canada RSS-GEN and Industry Canada RSS-132

COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRC161652
IC: 287AB-AS161652

PREPARED BY	APPROVED BY	DATED
Daria Fiedorowicz Senior Administrator (Technical)	Steve Scarfe Authorised Signatory	23 June 2020

Document 75949116 Report 03 Issue 1 **June 2020**

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	Radio 2212 B5 & KRC 161 652/1
IC Model Name	AS1616521
Serial Number(s)	CF85247615
Software Version	CXP9013268/15 Rev R82CV
Hardware Version	R2E
Non-Tested Variants	KRC 161 652/2 KRC 161 652/3
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2019 FCC CFR 47 Part 22: 2019 Industry Canada RSS-GEN: Issue 5: March 2019 Amendment 1 Industry Canada RSS-132: Issue 3: 2013
Test Plan	Test Plan FCC&IC NR legacy 20Q2
Start of Test	08 June 2020
Finish of Test	08 June 2020
Name of Engineer(s)	Neil Rousell
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 22. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Neil Rousell

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 22, Industry Canada RSS-GEN and Industry Canada RSS-132 is shown below.

Section	Specification Clause				Test Description	Result
	FCC CFR 47 Part 2	FCC CFR 47 Part 22	RSS-GEN	RSS-132		
2.1	2.1046	22.913 (a)	-	5.4	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	22.917 (b)	6.7	5.5	Occupied Bandwidth	Pass
2.3	2.1051	22.917(b)	-	5.5	Band Edge	Pass

Measurement Uncertainty Decision Statement

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

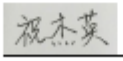
1.3 CONFIGURATION DESCRIPTION

Configuration	RAT	No. Of carriers	Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
				Bottom	Middle	Top
1	NR	1	15 MHz – SCS 15kHz	876.5	-	886.5
	NR	1	20 MHz – SCS 15kHz	879.0	-	884.0
	NR	1	20 MHz – SCS 60kHz	879.0	-	884.0
2	NR	2	10 MHz + 15 MHz SCS 15kHz using Carrier Aggregation	-	874.0+886.5	-

1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	Radio 2212 B5
PART NUMBER	KRC 161 652/1[1], KRC 161 652/2, KRC 161 652/3
IC Model Name	AS161652
SERIAL NUMBER	CF85247615
HARDWARE VERSION	R2E
SOFTWARE VERSION	CXP 901 3268/15 – R82CV
TRANSMITTER OPERATING RANGE	869 - 894 MHz
MODULATIONS	GSM: GMSK, AQPSK, 8PSK WCDMA: QPSK, 16QAM, 64QAM LTE & NR: QPSK, 16QAM, 64QAM, 256QAM
ITU DESIGNATION OF EMISSION	GSM: GMSK & AQPSK: 245KGXW, 8PSK: 245KG7W
	WCDMA 5 MHz BW channel: 5M00F9W
	LTE 1.4 MHz BW channel: 1M40W7D
	LTE 3 MHz BW channel: 3M00W7D
	LTE 5 MHz BW channel: 5M00W7D
	LTE 10 MHz BW channel: 10M0W7D
	NR 5 MHz BW channel: 5M00W7D
	NR 10 MHz BW channel: 10M0W7D
	NR 15 MHz BW channel: 15M0W7D
	NR 20 MHz BW channel: 20M0W7D
	NR 10+15 MHz CA channel: 25M0W7D
OUTPUT POWER (RMS) (W or dBm)	2 ports, 80W per port
FCC ID	TA8AKRC161652
IC ID	287AB-AS161652
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	Base station radio

[1] KRC 161 652/1 is the test object. All three products are identical with exception of /2 is with monitor port and /3 is with NEBS enclosure.

Signature 

Jieying Zhu

Date 2020-06-02

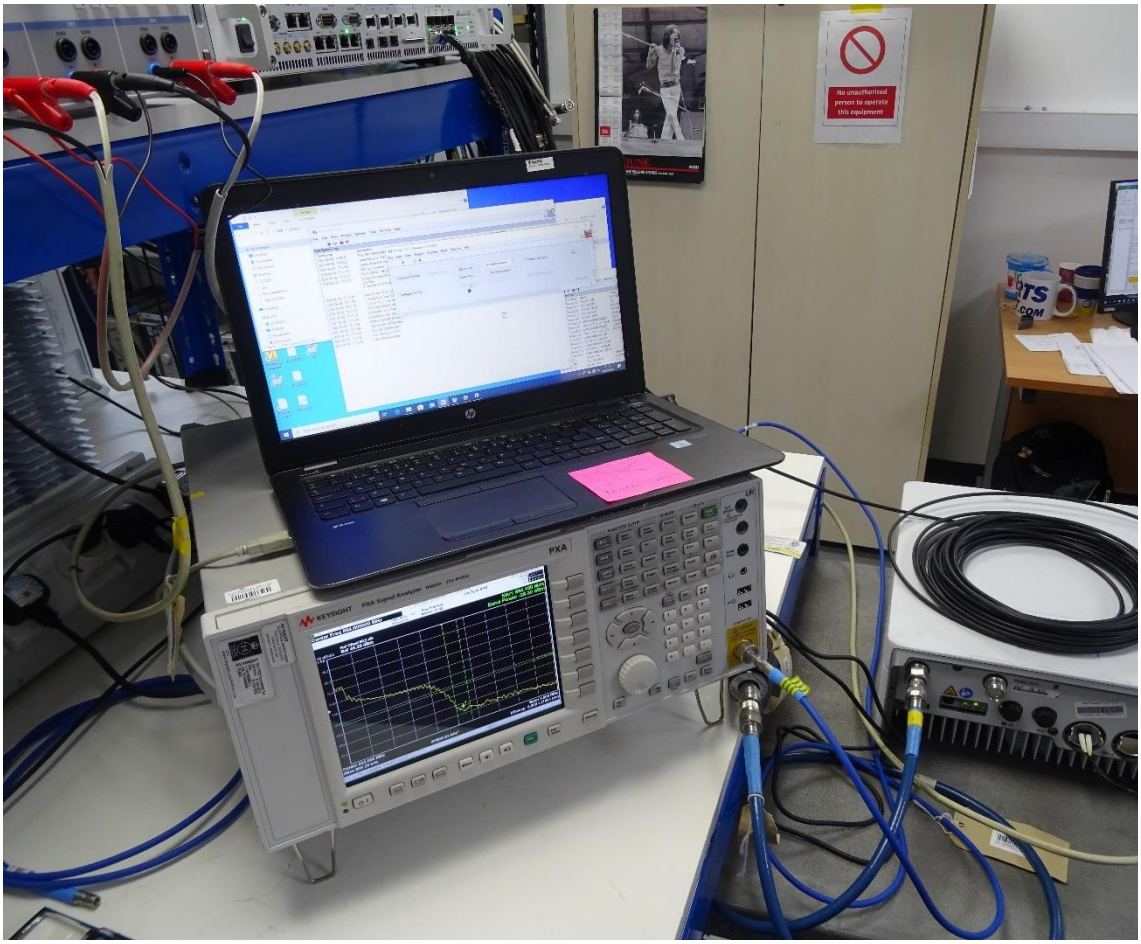
No responsibility will be accepted by TÜV SÜD Product Service UK Limited as to the accuracy of the information declared in this document by the manufacturer.

1.5 PRODUCT INFORMATION

1.5.1 Technical Description

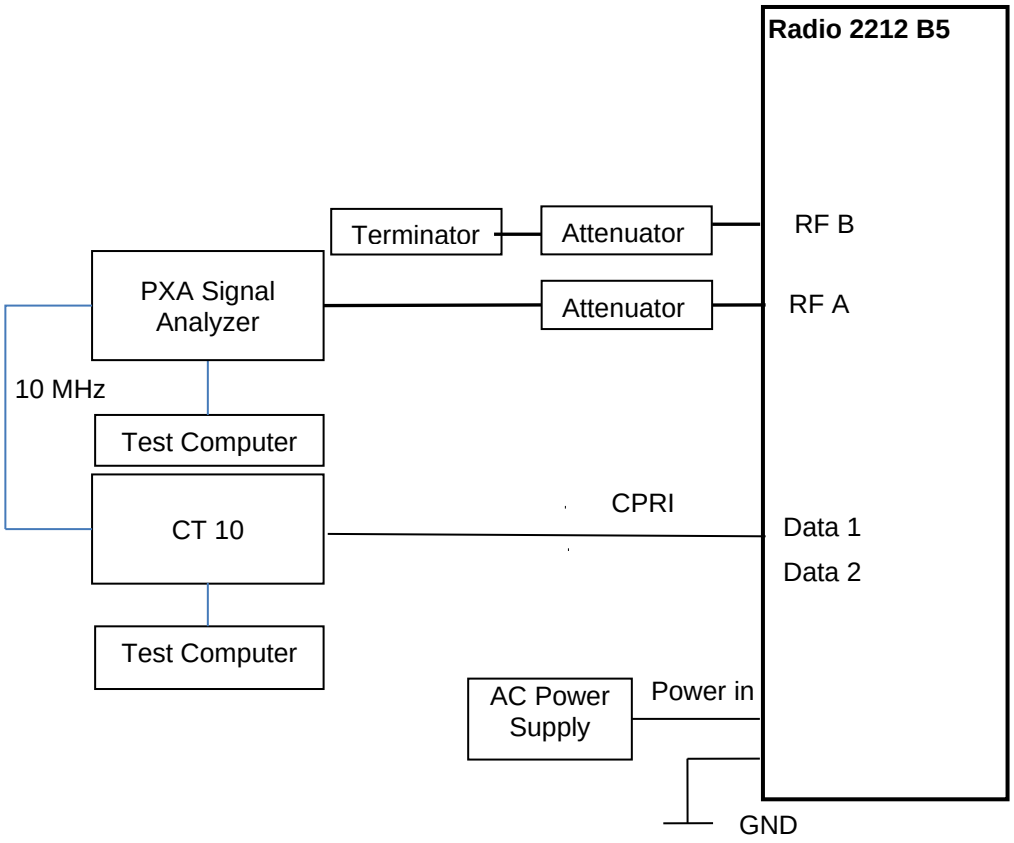
The Equipment Under Test (EUT) Radio 2212 B5 is an Ericsson AB Radio Unit working in the public mobile service 850 MHz band which provides communication connections to 850 MHz network. The Radio 2215 B5 operates from a -48V DC supply.

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
90987 Octagon House, Fareham Test Laboratory

ISED Accreditation
ISED#12669A Octagon House, Fareham Test Laboratory

Test Name	Name of Engineer(s)
Maximum Peak Output Power and Peak to Average Ratio - Conducted	Neil Rousell
Occupied Bandwidth	Neil Rousell
Band Edge	Neil Rousell

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

Testing to show compliance of the Radio 2212 B5 KRC 161 652/1 without monitor

Ericsson declare that the Radio 2212 B5 KRC 161 652/2 with monitor port and Radio 2212 B5 KRC 161 652/3 with NEBS Enclosure are equivalent in Radio performance terms, and as such no extra testing is required to prove conformity.

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 2, Clause 2.1046
FCC CFR 47 Part 22, Clause 22.913 (a)
Industry Canada RSS-132, Clause 5.4

2.1.2 Date of Test and Modification State

08 June 2020 - 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	22.0°C
Relative Humidity	47.2%

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.

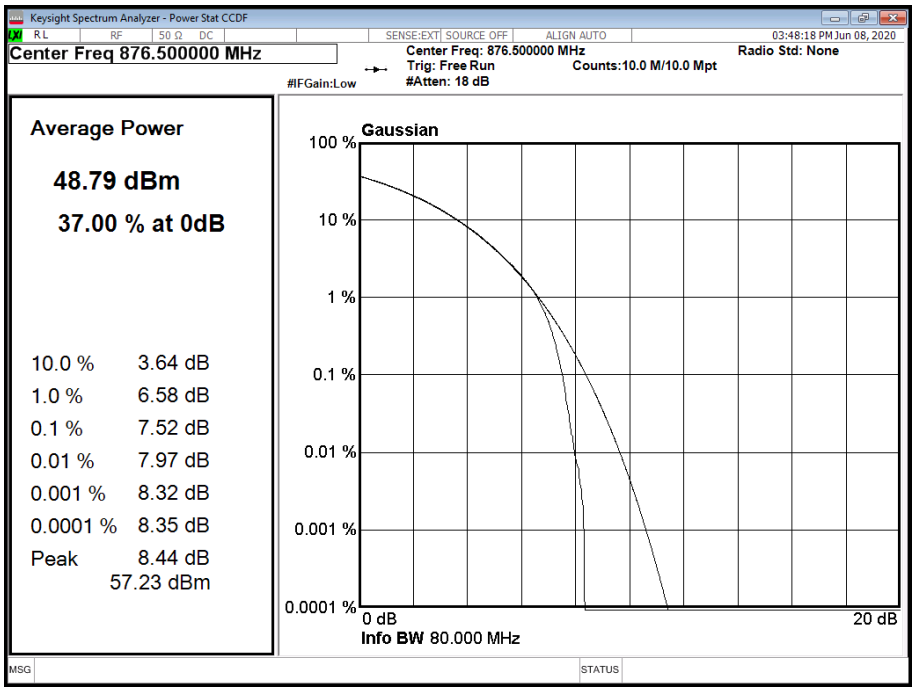
2.1.6 Test Results

Configuration 1

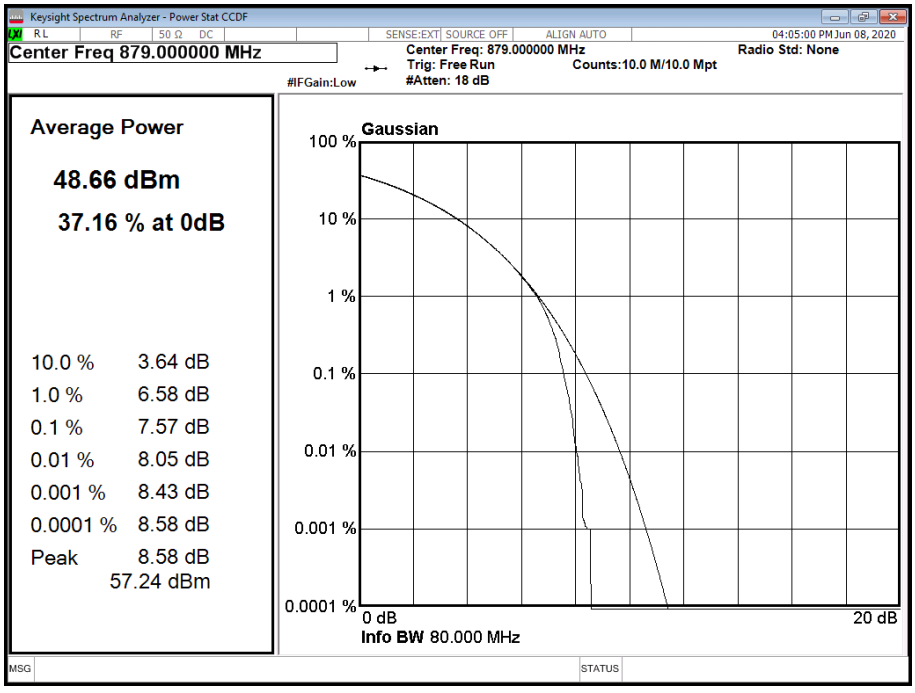
Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position B		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	15.0 MHz 15 kHz SCS	7.52	48.76	38.18
A	QPSK	20.0 MHz 15 kHz SCS	7.57	48.59	36.88
A	QPSK	20.0 MHz 60 kHz SCS	-	48.80	-

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



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

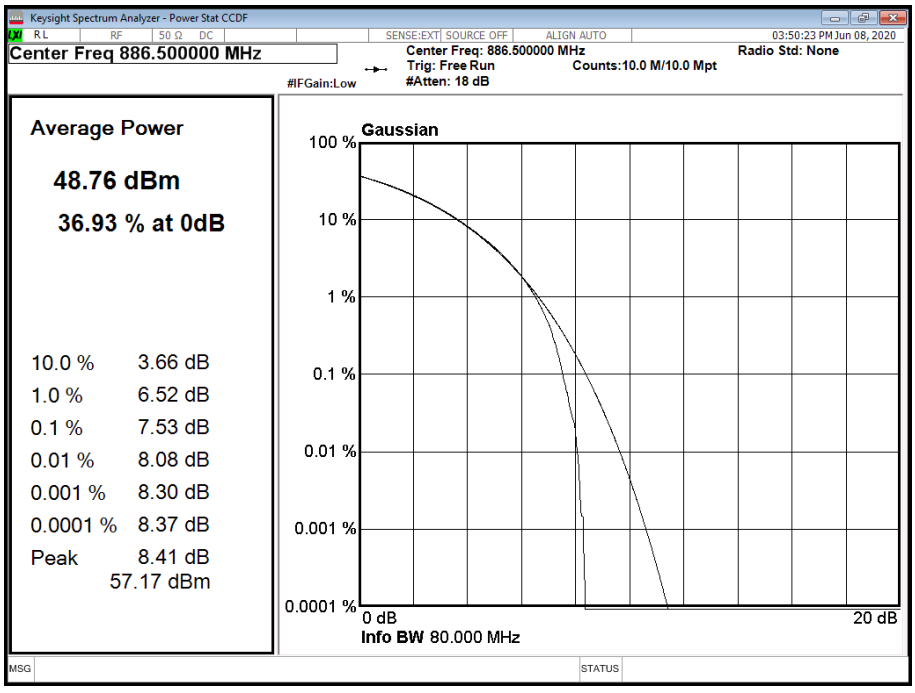


Configuration 1

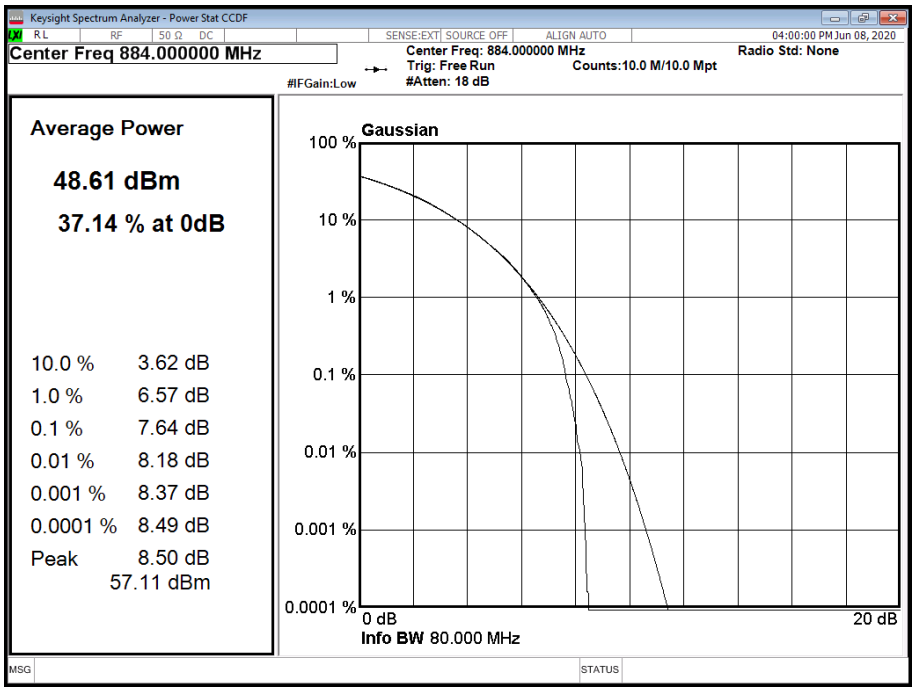
Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position T		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	15.0 MHz 15 kHz SCS	7.53	48.75	38.37
A	QPSK	20.0 MHz 15 kHz SCS	7.64	48.58	36.83
A	QPSK	20.0 MHz 60 kHz SCS	-	48.81	-

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



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



Configuration 2

Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power		
			Channel Position M		
			PAR (dB)	Average Power	
				dBm	dBm/MHz
A	QPSK	10.0 + 15.0 MHz CA 15 kHz SCS	-	48.48	-

Limit	
Peak Power	≤ 1640 W/MHz or ≤+62.15 dBm
Peak to Average Ratio	13 dB

2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049
FCC CFR 47 Part 22, Clause 22.917 (b)
Industry Canada RSS-GEN, Clause 6.7
Industry Canada RSS-132, Clause 5.5

2.2.2 Date of Test and Modification State

08 June 2020 - 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	22.0°C
Relative Humidity	47.2%

2.2.5 Test Method

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

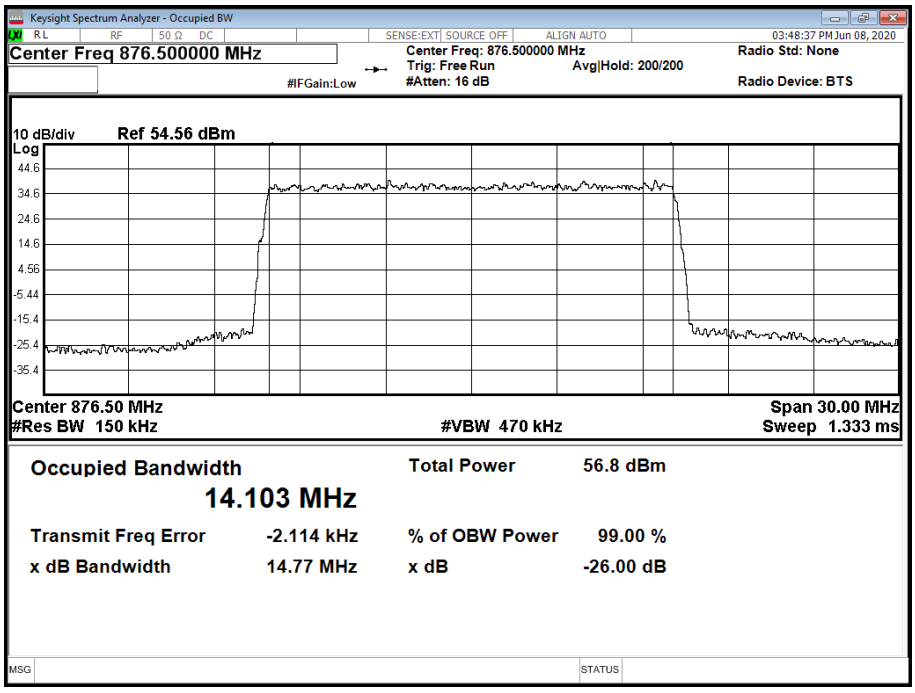
2.2.6 Test Results

Configuration 1

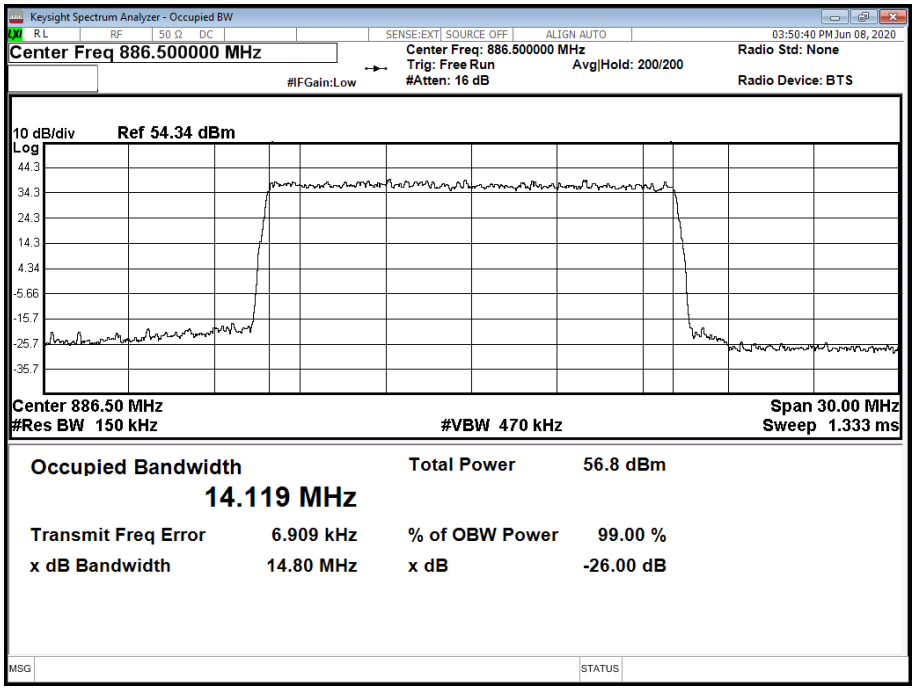
Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Result (KHz)			
			Channel Position B		Channel Position T	
			Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth
A	QPSK	15.0 MHz 15 kHz SCS	14,103.10	14,774.72	14,118.97	14,795.22
A	QPSK	20.0 MHz 15 kHz SCS	18,890.46	19,759.62	18,901.10	19,731.00
A	QPSK	20.0 MHz 60 kHz SCS	17,199.96	19,566.09	17,170.43	19,578.71

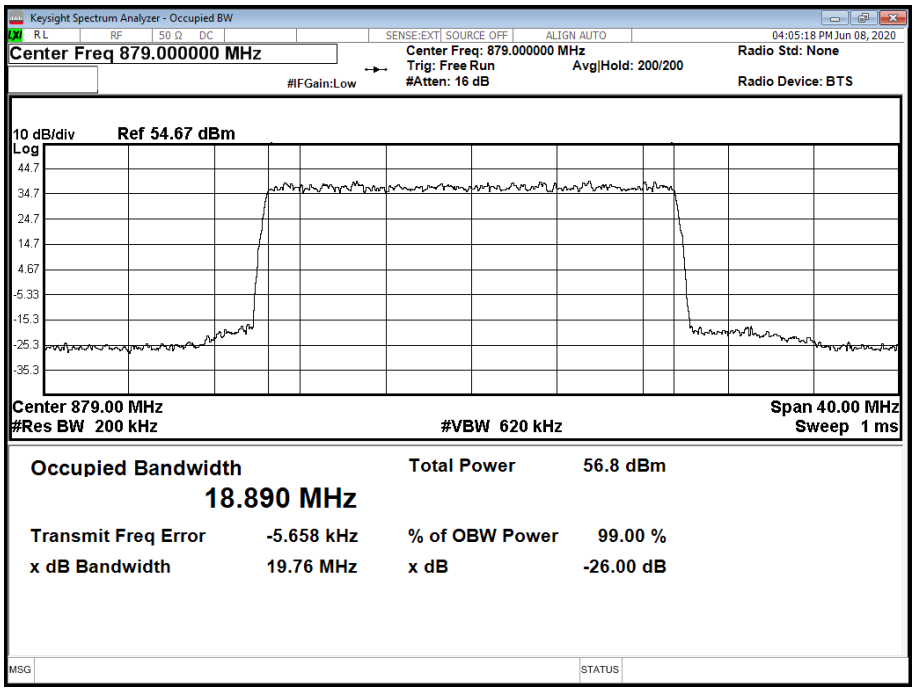
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B



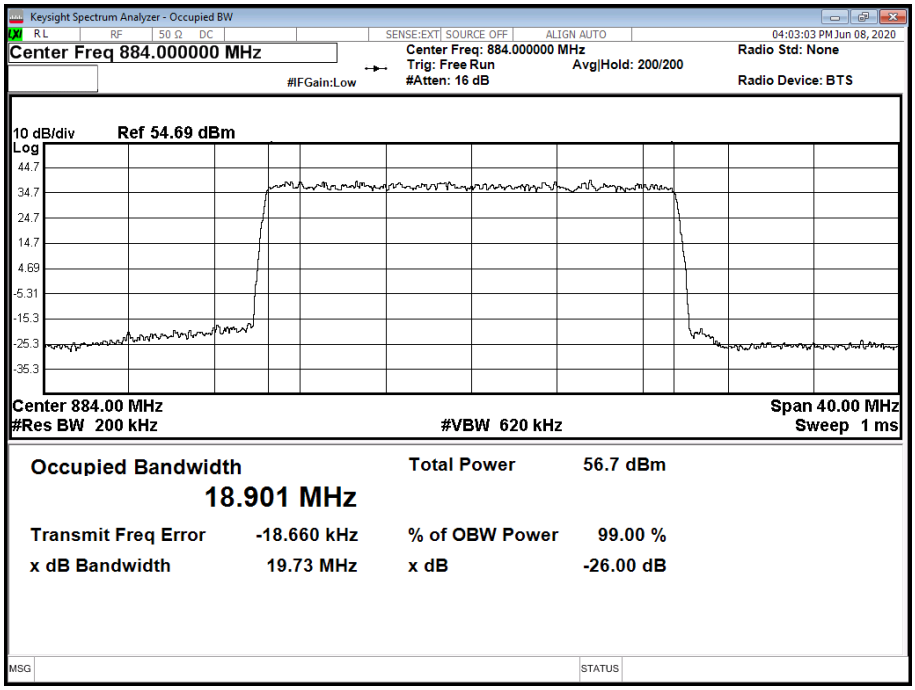
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T



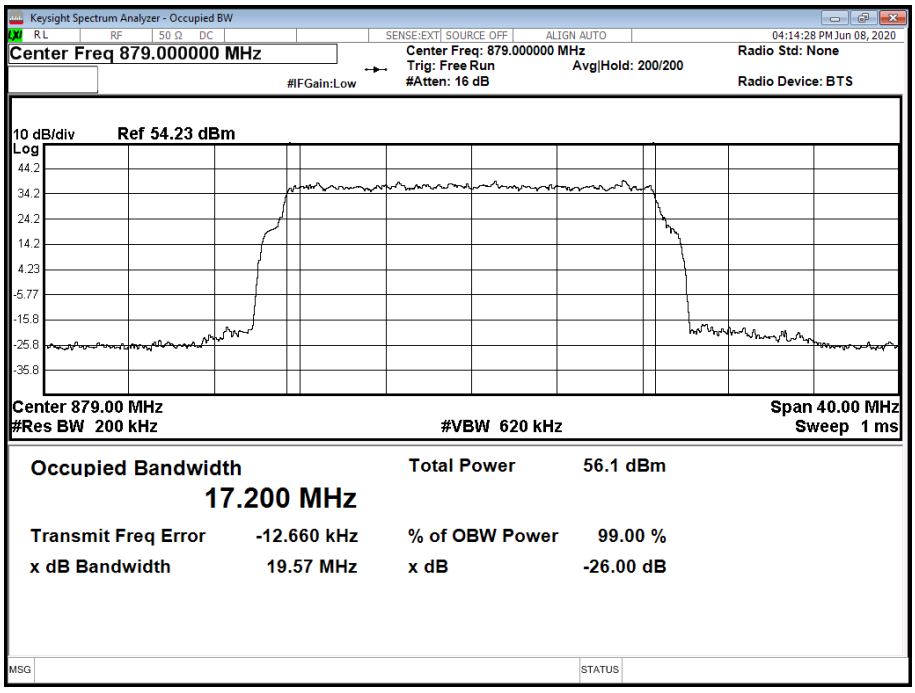
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B



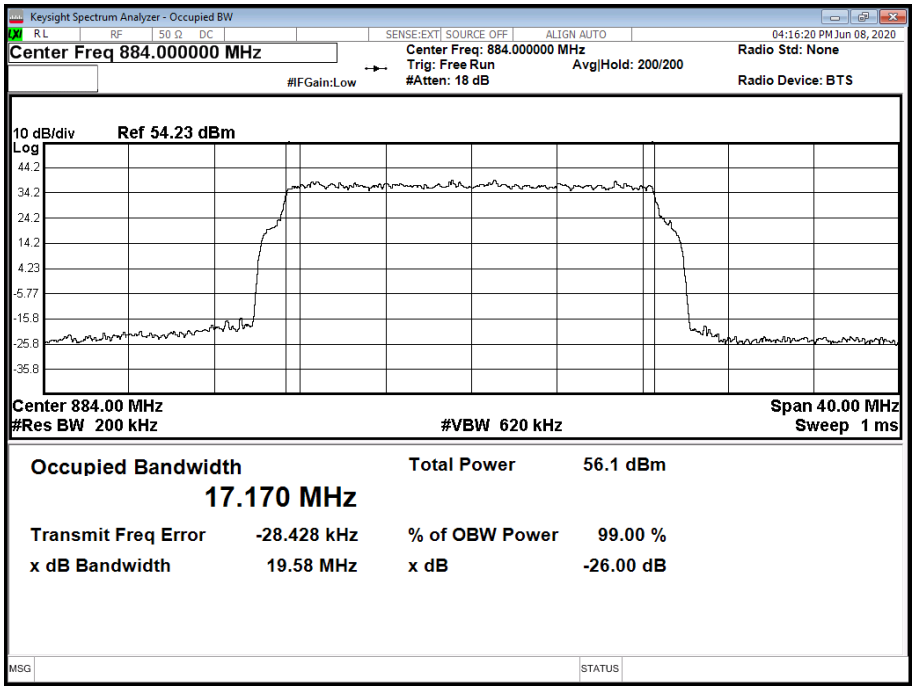
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position B



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position T

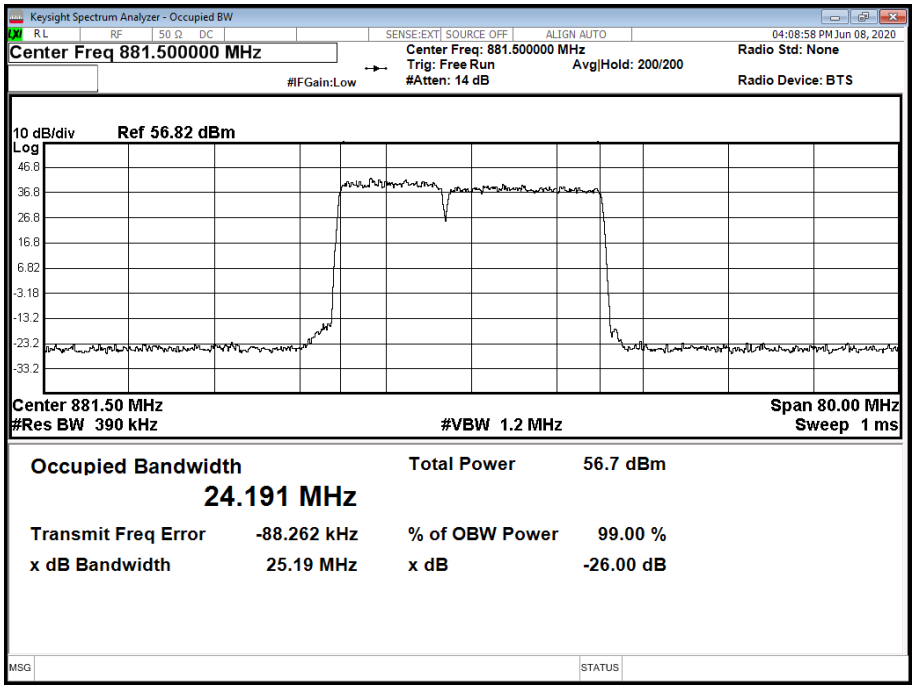


Configuration 2

Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Result (KHz)	
			Channel Position M	
			Occupied Bandwidth	-26 dB Bandwidth
A	QPSK	10.0 + 15.0 MHz CA 15 kHz SCS	24,190.65	25,191.67

Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 + 15.0 MHz CA 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 22, Clause 22.917(b)
Industry Canada RSS-132, Clause 5.5

2.3.2 Date of Test and Modification State

08 June 2020 - 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	22.0°C
Relative Humidity	47.2%

2.3.5 Test Method

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

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 dBm - 10 * Log (1) = -13 dBm.

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

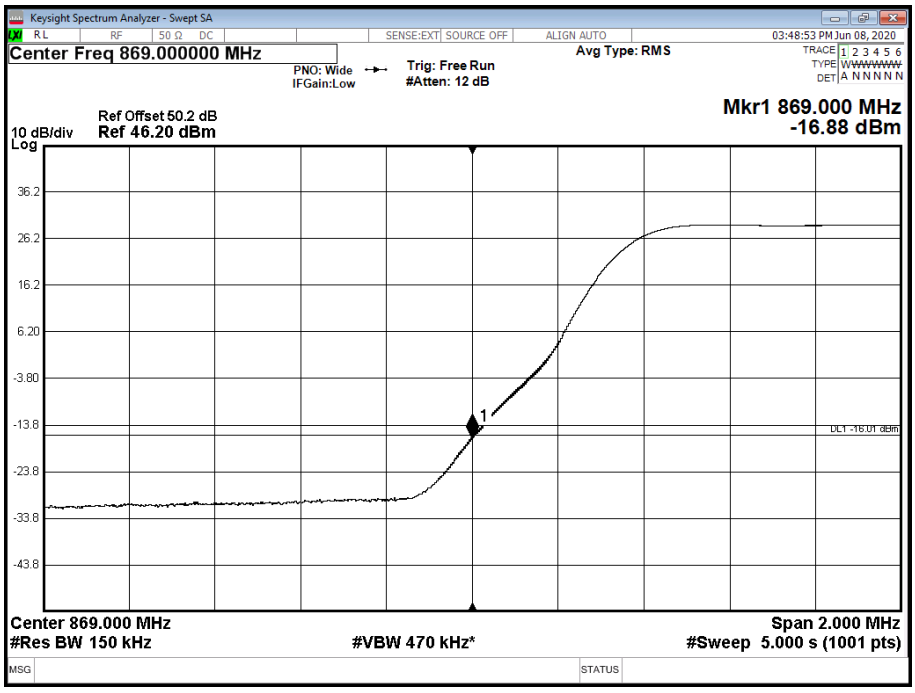
2.3.6 Test Results

Configuration 1

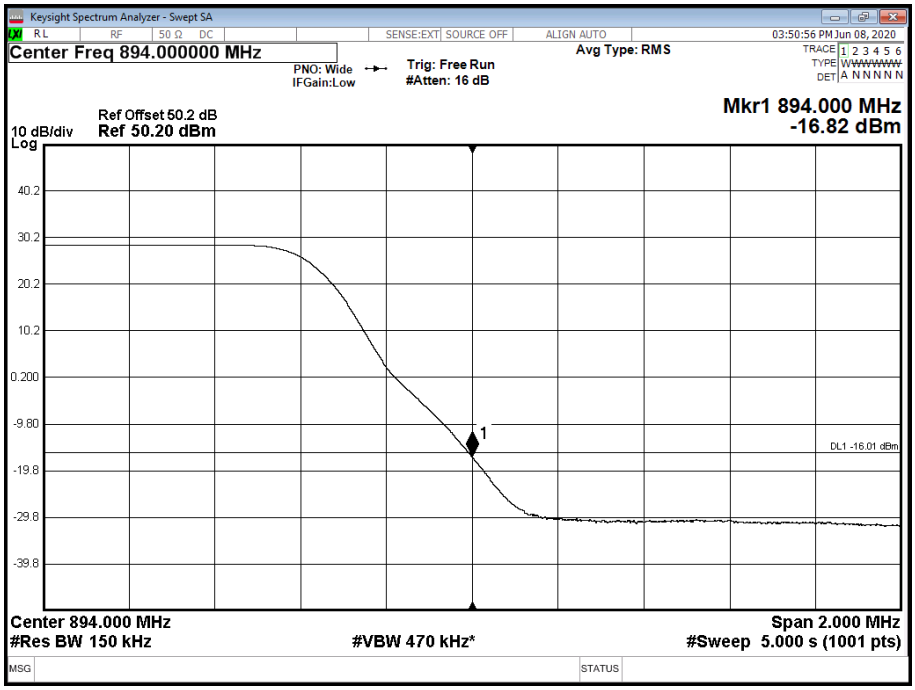
Maximum Output Power 49 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Band Edge (MHz)	
			Channel Position B	Channel Position T
A	QPSK	15.0 MHz 15 kHz SCS	876.5	886.5
A	QPSK	20.0 MHz 15 kHz SCS	879.0	884.0
A	QPSK	20.0 MHz 60 kHz SCS	879.0	884.0

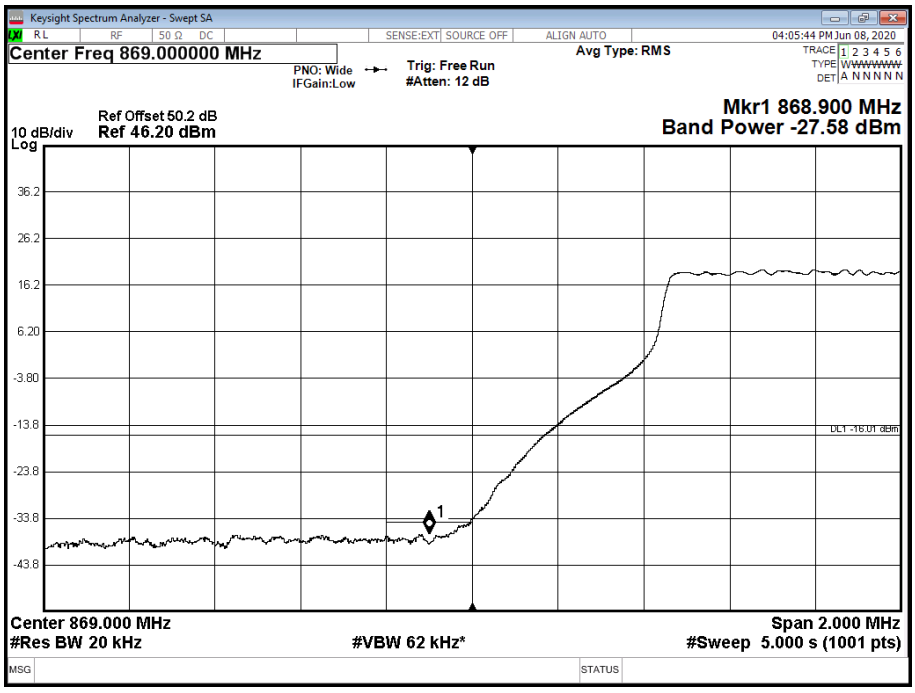
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B



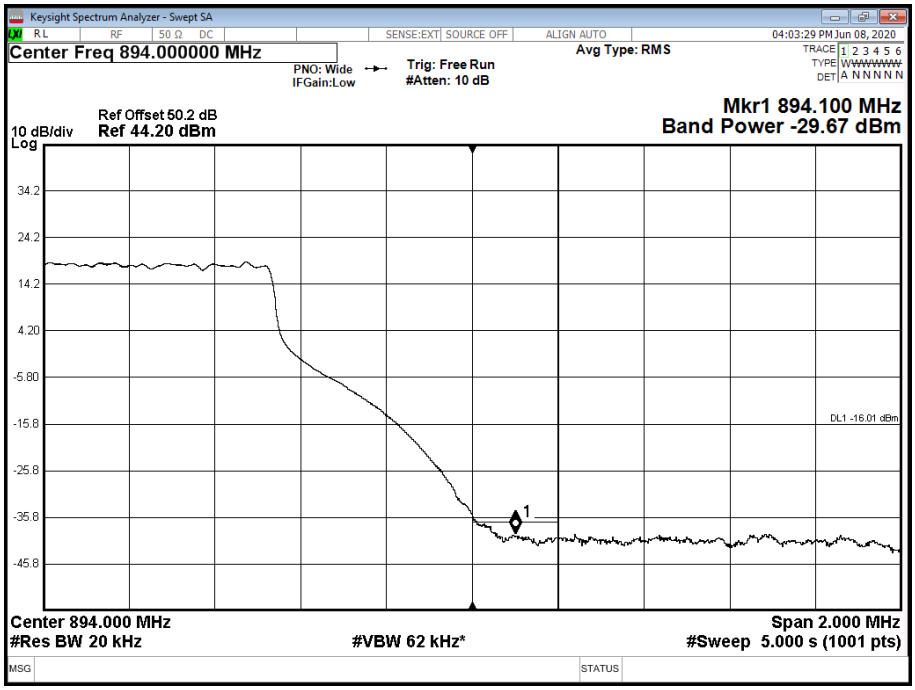
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T



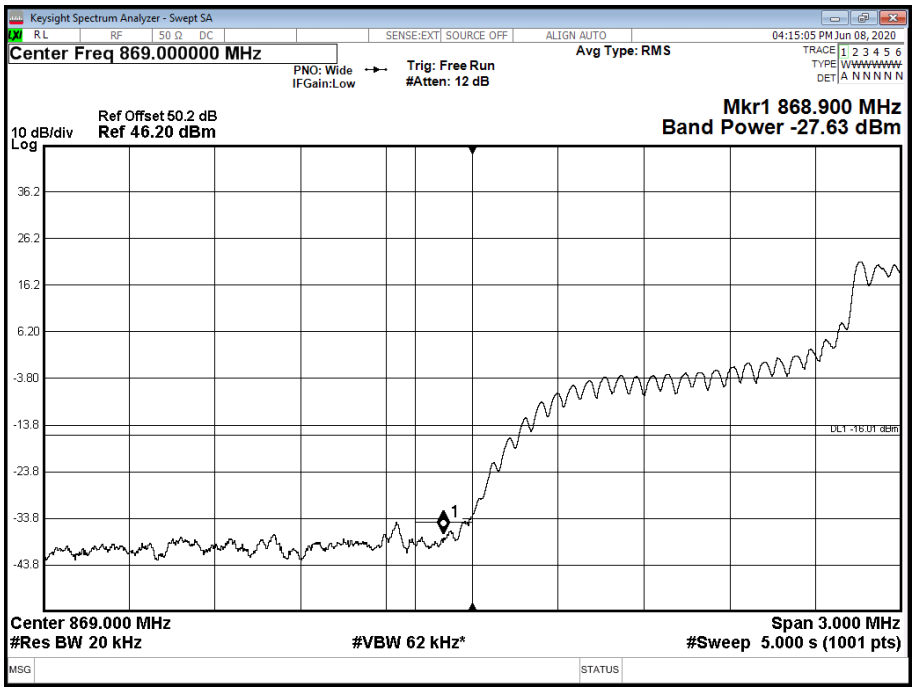
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B



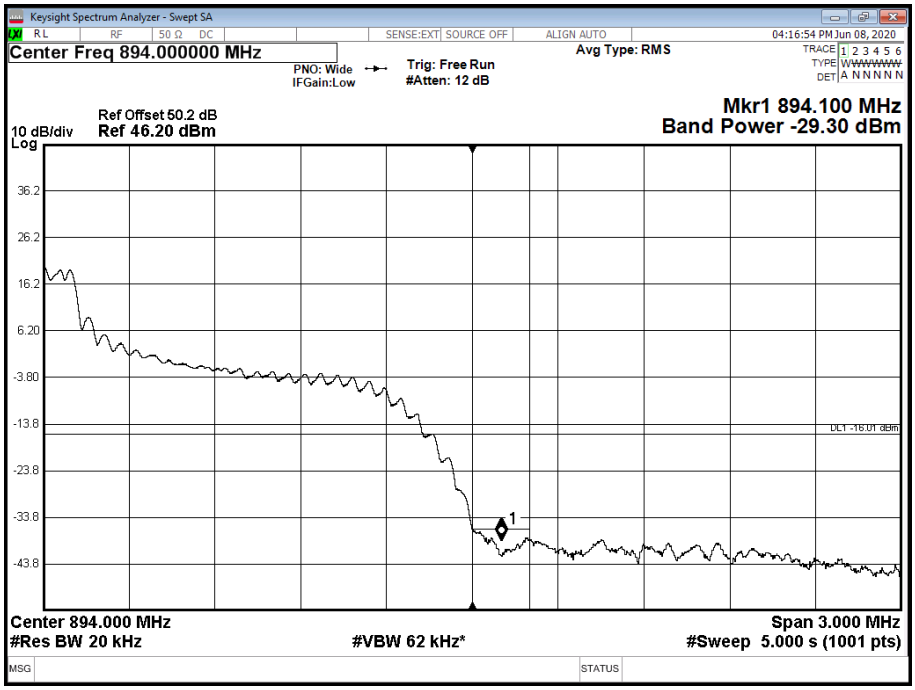
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position B



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 60 kHz SCS - Channel Position T



Limit	-16 dBm

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
Maximum Peak Output Power and Peak to Average Ratio - Conducted					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	O/P MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Occupied Bandwidth					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	O/P MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Band Edge					
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P MON
Multimeter	Fluke	177	3813	12	09-Oct-2020
Attenuator 20dB 100W	Weinschel	48-20-43-LIM	5133	12	29-Nov-2020
Attenuator 30dB 100W	Weinschel	48-30-43-LIM	5135	-	O/P MON
PXA Signal Analyser	Keysight	N9030A	4654	12	21-Oct-2020
Frequency Standard	Spectracom	SecureSync 1200-0408-0601	4393	6	08-Nov-2020
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	08-Nov-2020
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020

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		± 0.95 dB
Occupied Bandwidth	Up to 20 MHz Bandwidth	15 MHz Bandwidth	± 353.784 kHz
		20 MHz Bandwidth	± 145.903 kHz
		25 MHz Bandwidth	± 262.897 kHz
Band Edge	30 MHz to 20 GHz Amplitude		±0.95 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

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

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

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

ANNEX A

MODULE LIST

Configuration 1 & 2			
Product	Product No	R-State	Serial No
Radio 2212 B5	KRC 161 652/1	R2E	CF85247615
Software Version:	CXP9013268/15	Revision:	R82CV