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Report On

FCC and ISED Testing of the Ericsson Radio 2203 B66A, KRC 161 553-1 NR (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: TA8AKRC161553-1 IC: 287AB-AS1615531

PREPARED BY

APPROVED BY

DATED

Myalanhoj

Maggie Whiting Key Account Manager

Steve Scarfe Authorised Signatory 05 May 2022

Document 75954487 Report 09 Issue 1

May-2022



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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	Radio 2203 B66A - KRC 161 553-1
IC Model Name	AS1615531
Serial Number(s)	C82A558731
Software Version	CXP9013268/9 -R84JD
Hardware Version	R1E
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2020 FCC CFR 47 Part 27: 2020 ISED RSS-GEN: Issue 5: March 2019 Amendment 1, 2021 Amendment 2 Industry Canada RSS-139: Issue 3: 2015
Test Plan	MR7602LTE-NR_FDD_Spectrum_Sharing_with_NB-IoT 9 Radios FCC and ISED V 1.0
Start of Test	11-March-2022
Finish of Test	04-April-2022
Name of Engineer(s)	Neil Rousell, Graeme Lawler
Related Document(s)	KDB 971168 D01 v02r02 KDB 662911 D01 v02r01 ICES-003:Issue 7 (2020-10) 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: 2020, FCC CFR 47 Part 27: 2020, ISED RSS-GEN: Issue 5: March 2019 Amendment 1, 2021 Amendment 2, 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);

Som Gellander.

Neil Rousell, Graeme Lawler



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.

	Specification C	ause				
Section	FCC CFR 47	FCC CFR 47	RSS-	RSS-	Test Description	Result
	Part 2	Part 27	GEN	139		
2.1	2.1046	27.50	-	6.5	Maximum Peak Output Power and Peak to Average Ratio - Conducted	Pass
2.2	2.1049	27.53	6.6	-	Occupied Bandwidth	Pass
2.3	2.1051	27.53	-	6.5	Band Edge	Pass
2.4	2.1051	27.53	-	6.6	Transmitter Spurious Emissions	Pass
2.5	2.1053	27.53	6.3	6.6	Radiated Emissions	Pass



1.3 TEST RATIONALE

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



1.4 CONFIGURATION DESCRIPTION

	Carrier configurations				NR	Main carrie	ər
Config No	RATs	Carriers	Pout (W)	Position	BW	Freq	NR-ARFCN
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	В	10	2115	423000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	М	10	2145	431000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	Т	10	2175	439000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	В	15	2117.5	423500
1	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	М	15	2145	431000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	Т	15	2172.5	438500
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	В	20	2120	424000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	М	20	2145	431000
	NR in NR/ESS Setup (NB IoT IB) QPSK	1	5	Т	20	2170	438000



1.5 DECLARATION OF BUILD STATUS

Technical Description: (Please provide a brief description of the intended use of the equipment including the technologies the product supports)					
Manufacturer:					
Model:					
	Radio 2203 B66A KRC 161 553/1				
	R1E				
	CXP9013268/9-R84JD				
	TA8AKRC161553-1				
	287AB-AS1615531				
TX (DL): 2110 - 2180 MHz	RF BW: 70MHz & IBW:45MHz				
1780 MHz	RF BW: 70MHz				
2155 MHz	RF BW/IBW :45MHz				
1755 MHz	RF BW/IBW :45MHz				
	per port 5W				
	PWR/Carrier(Max)				
5MHz	5 W				
10MHz	5 W				
15MHz	5W				
20MHz	5W				
5MHz	5W				
2 RX / 2TX					
FDD					
Multi RAT : WCDM	/A, LTE, NR, NB-IoT (IB, GB, SA) A,+LTE ; WCDMA,+ NR: LTE+ NR; LTE+ NB- IA; LTE+ NR + NB-IoT SA; LTE+ WCDMA+ NB				
NR: 5MHz, 10MHz	, 15MHz, 20MHz				
LTE: 5MHz, 10MHz	z, 15MHz, 20MHz				
WCDMA : 5 MHz					
NB-IoT(SA): 200 kHz					
Maximum antenna system gain (including cable loss), GANT (dBi) for the tested configurations to comply with maximum radiated output power in SRSP -513 calculated using measured and summed PSD from all 2 Ports					
50					
QPSK, 16QAM, 64	QAM, 256QAM				
QPSK, 16QAM, 64	QAM, 256QAM				
QPSK, 16QAM, 64	QAM				
	t supports) TX (DL): 2110 - 2180 MHz RX (UL): 1710 - 1780 MHz TX (DL): 2110 - 2155 MHz RX (UL): 1710 - 1755 MHz 37.0 Max output power I BW 5MHz 10MHz 15MHz 20MHz 5MHz 20MHz 5MHz 20MHz Single RAT :WCDM Nulti RAT : WCDM IoT LTE+ NR + WCDM IoT SA; NR: 5MHz, 10MHz LTE: 5MHz, 10MHz LTE: 5MHz, 10MHz LTE: 5MHz, 10MHz NR: 5MHz, 10MHz NR: 5MHz, 10MHz NR: 5MHz, 10MHz NB-IoT(SA): 200 kl Maximum antenna for the tested config output power in SR summed PSD from 50 QPSK, 16QAM, 64 QPSK, 16QAM, 64				



NR SCS	15kHz				
RF power Tolerance:	.+0.6/-2.0 dB	.+0.6/-2.0 dB			
Frequency Tolerance:	±0.05 ppm				
Carrier Aggregation, CA	Supported				
Maximum supported number of DL NR carrier per port	3/Band				
Maximum supported number of DL LTE carrier per port	3/Band				
Maximum supported number of DL WCDMA carrier per port	4/Band				
Nominal output power per Antenna Port / Band	SRO / MRO: Single	/ Multi Carrier: 5W (37,0 dBm)		
Supported transmission modes:	2X2 MIMO				
Unintentional Radiators					
Highest frequency generated or used in the devic tunes			Up to 9,8 Gbit/s		
Lowest frequency generated or used in the devic tunes if <30MHz	e or on which the devi	ce operates or			
Class A Digital Device (Use in commercial, indus	trial or business enviro	onment)			
Class B Digital Device (Use in residential environ	iment)		Class B		
DC Power Supply (Delete if Not Applicable)					
Nominal voltage:		-48V DC/ 100-250	DV AC		
Extreme upper voltage:		-36V DC/ 275 V	AC		
Extreme lower voltage:		-58.5V DC/ 85 \	/ AC		
Max current:	16	A single radio /32A	Dual radio		
Temperature					
Minimum temperature:		-40°C			
Maximum temperature:		55°C			
Ancillaries					
Manufacturer:	Х	Part Number:	Х		
Model:	Х	Model:	Х		
I hereby declare that I am entitled to sign on be	half of the manufactur and complete.	er and that the infor	mation supplied is correct		
Name:	Afrah Ali sadiq				
Position held:	Regulatory Approval Engineer				
Email address:	Afrah.ali.sadiq@ericsson.com				
Telephone number:		.+46724650796			
Date:		04-May-2022	2		

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

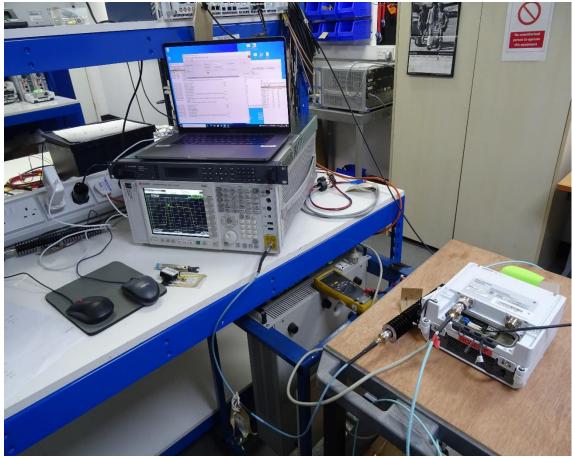


1.6 **PRODUCT INFORMATION**

1.6.1 Technical Description

The Equipment Under Test (EUT) Radio 2203 B66A - KRC 161 553-1 is an Ericsson AB Radio Unit working in the public mobile service 66A band which provides communication connections to 66A 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.

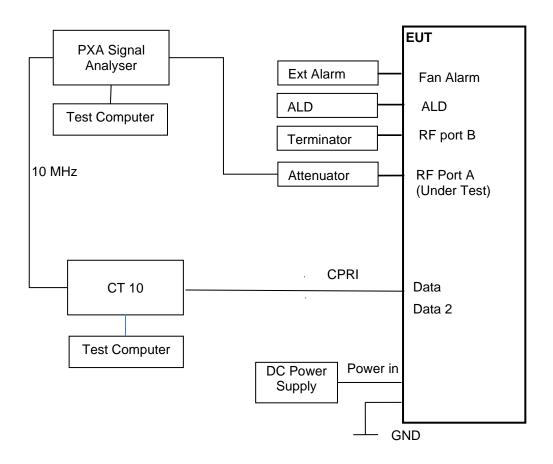


Equipment Under Test



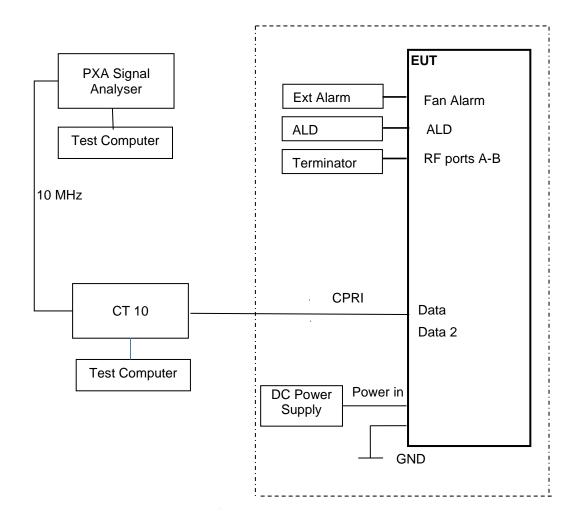
1.7 TEST SETUP

Conducted Test Set Up





Radiated Test Set Up – Dashed line indicates equipment inside the Chamber for Radiated testing.





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 90987 Octagon House, Fareham Test Laboratory Postal Address: Octagon House, Concorde Way, Fareham, Hampshire, UK, PO15 5RL

ISED Accreditation IC#12669A Octagon House, Fareham Test Laboratory Postal Address: Octagon House, Concorde Way, Fareham, Hampshire, UK, PO15 5RL

Under our UKAS Accreditation, TÜV SÜD conducted the following tests Octagon House, Fareham 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
Transmitter Spurious Emissions	Neil Rousell
Radiated Emissions	Graeme Lawler

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

Ericsson will limit this product through the software from operating across the whole of Band 66, it will be limited to 66A, DL 2110-2180 MHz, UL 1710-1780 MHz.

This filing is for a Class II permissive change procedure for FCC and the class III permissive change procedure for ISED of the added NB-IoT functionality to NR to a previously certified Radio for use in the USA and Canada under the following ID's:

FCC ID: TA8AKRC161553-1 ISED ID: 287AB-AS1615531 Hardware Version: R1E This device is electrically identical as originally certified as no hardware changes have been made

This EUT uses the same port for Tx and Rx and therefore RX Spurious Emisisons has not been performed. Rx Spurious Emissions have been covered by testing to FCC Part 15B, which are covered by a seprate test report.

Frequency Stability was verified at the time of the original certification and is covered by a seperate report.



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 6.5 FCC CFR 47 Part 2, Clause 2.1046

2.1.2 Date of Test and Modification State

11-March-2022 - Modification State 0

2.1.3 Test Equipment Used

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

2.1.4 Environmental Conditions

Ambient Temperature22.2°CRelative Humidity39.3%

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 37.00 dBm

				Peak to Average Ratio (PAR) / Output Power / PSD								
				Channel Position B								
Antenna	NR Modulation	NR Carrier Bandwidth	PAR (dB)		verage ver/PSD	Total Power Port A + B	Total Power Port A + B	GANT* Limit 62.15dB	GANT* Limit 65.15dB			
				dBm	dBm/MHz	dBm	dBm/MHz	dBi	dBi			
А	QPSK	10.0 MHz 15 kHz SCS	7.19	36.91	28.00	39.92	31.01	31.14	34.14			
А	QPSK	15.0 MHz 15 kHz SCS	7.27	36.99	27.56	40.00	30.57	31.58	34.58			
А	QPSK	20.0 MHz 15 kHz SCS	7.25	36.98	27.71	39.99	30.72	31.43	34.43			

Remarks

Calculations:

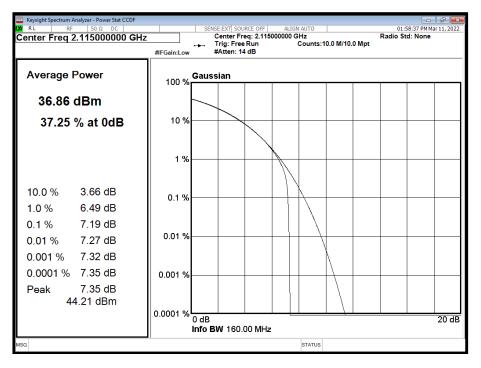
Total Power = Measured Output Power (port A) + 10log (NANT)

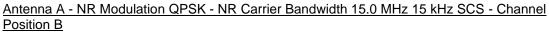
Where NANT refers to the number of Ports.

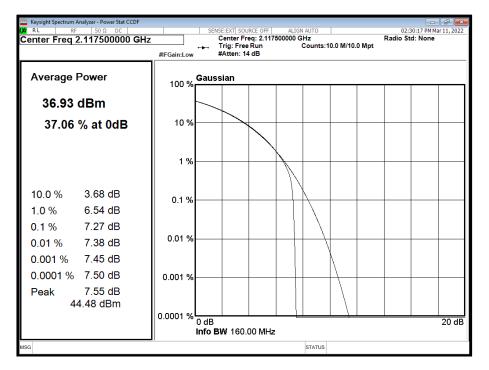


* Maximum antenna system gain (including cable loss), GANT (dBi) 50 ohm, for the tested configurations, to comply with Maximum radiated output power in ISED SRSP-513, calculated using measured and summed PSD from both ports.

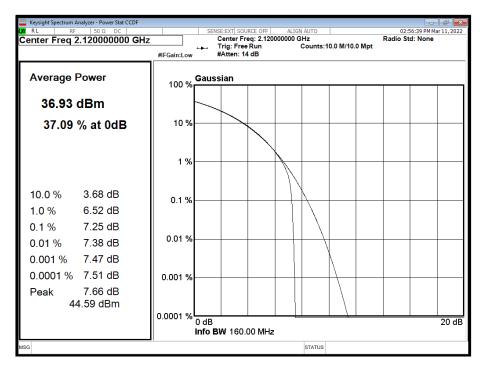
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B











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

Configuration 1

Maximum Output Power 37.00 dBm

				Peak to Average Ratio (PAR) / Output Power / PSD								
				Channel Position M								
Antenna	NR Modulation	NR Carrier Bandwidth	PAR (dB)		verage wer/PSD	Total Power Port A + B	Total Power Port A + B	GANT* Limit 62.15dB	GANT* Limit 65.15dB			
				dBm	dBm/MHz	dBm	dBm/MHz	dBi	dBi			
А	QPSK	10.0 MHz 15 kHz SCS	7.17	37.01	28.10	40.02	31.11	31.04	34.04			
А	QPSK	15.0 MHz 15 kHz SCS	7.27	36.89	27.53	39.90	30.54	31.61	34.61			
А	QPSK	20.0 MHz 15 kHz SCS	7.22	36.91	27.39	39.92	30.40	31.75	34.75			

<u>Remarks</u>

Calculations:

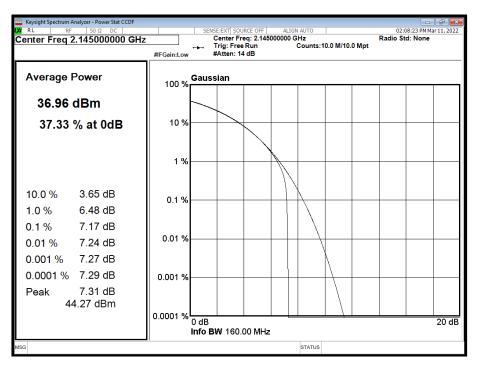
Total Power = Measured Output Power (port A) + 10log (NANT)

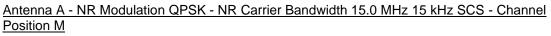
Where NANT refers to the number of Ports.

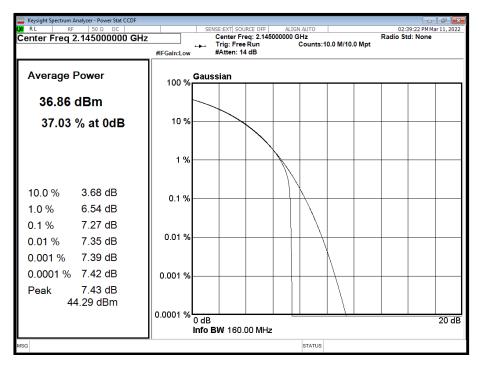
* Maximum antenna system gain (including cable loss), GANT (dBi) 50 ohm, for the tested configurations, to comply with Maximum radiated output power in ISED SRSP-513, calculated using measured and summed PSD from both ports.



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

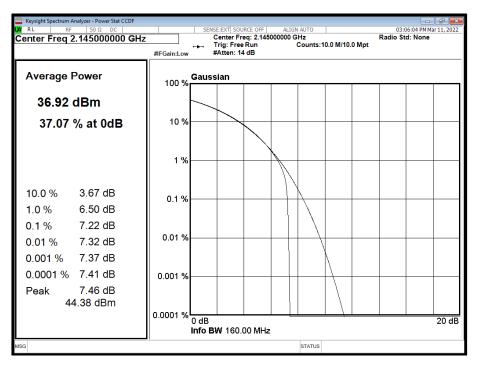








Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M



Configuration 1

Maximum Output Power 37.00 dBm

				Peak to Average Ratio (PAR) / Output Power / PSD								
				Channel Position T								
Antenna	NR Modulation	NR Carrier Bandwidth	PAR (dB)		verage ver/PSD	Total Power Port A + B	Total Power Port A + B	GANT* Limit 62.15dB	GANT* Limit 65.15dB			
				dBm	dBm/MHz	dBm	dBm/MHz	dBi	dBi			
А	QPSK	10.0 MHz 15 kHz SCS	7.22	36.77	28.19	39.78	31.20	30.95	33.95			
А	QPSK	15.0 MHz 15 kHz SCS	7.31	36.80	27.74	39.81	30.75	31.40	34.40			
А	QPSK	20.0 MHz 15 kHz SCS	7.32	36.78	27.70	39.79	30.71	31.44	34.44			

<u>Remarks</u>

Calculations:

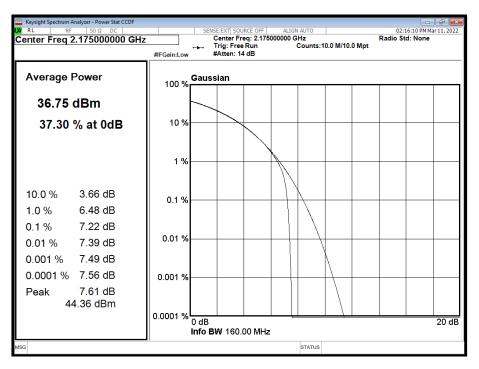
Total Power = Measured Output Power (port A) + 10log (NANT)

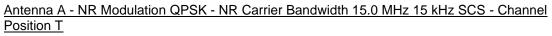
Where NANT refers to the number of Ports.

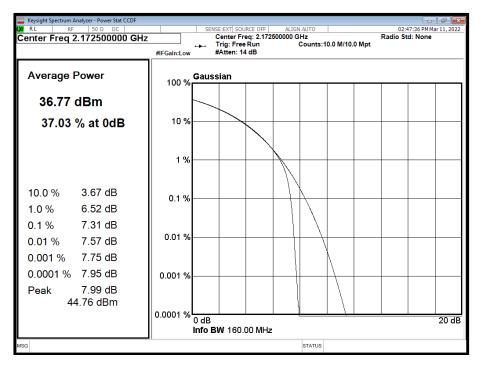
* Maximum antenna system gain (including cable loss), GANT (dBi) 50 ohm, for the tested configurations, to comply with Maximum radiated output power in ISED SRSP-513, calculated using measured and summed PSD from both ports.



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

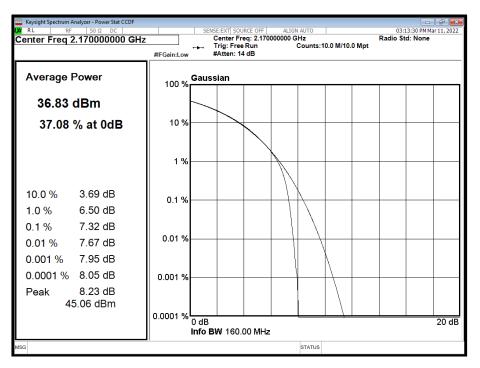








Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T



FCC Part 27.50 Clauses (d)

Base and Fixed Stations in the following Bands	Description	EIRP (watts/MHz)
995-2000 MHz, 2110-2155 MHz,	Non-Urban	3280
2155-2180 MHz or 2180-2200 MHz	Urban	1640

RSS-139 Clause 6.4

Limit				
EIRP	≤ 1 W (1710-1780 MHz)			
Peak to Average Ratio	13 dB			



Limit	
Maximum EIRP (Non-Urban)	 ≤ 3280 W/MHz or ≤+65.15 dBm ≤ 1070 W/MHz or ≤+60.30 dBm (antenna height ≤500m) ≤ 490 W/MHz or ≤+56.90 dBm (antenna height ≤1000m) ≤ 270 W/MHz or ≤+54.31 dBm (antenna height ≤1500m) ≤ 160 W/MHz or ≤+52.04 dBm (antenna height ≤2000m)
Maximum EIRP (Urban)	$\leq 1640 \text{ W/MHz or } \leq +62.15 \text{ dBm} \text{ (antenna height } \leq 300\text{m})$ $\leq 1070 \text{ W/MHz or } \leq +60.30 \text{ dBm} \text{ (antenna height } \leq 500\text{m})$ $\leq 490 \text{ W/MHz or } \leq +56.90 \text{ dBm} \text{ (antenna height } \leq 1000\text{m})$ $\leq 270 \text{ W/MHz or } \leq +54.31 \text{ dBm} \text{ (antenna height } \leq 1500\text{m})$ $\leq 160 \text{ W/MHz or } \leq +52.04 \text{ dBm} \text{ (antenna height } \leq 2000\text{m})$

SRSP-513 Power and Antenna Height Limitations Clause 5.1.1 & 5.1.2



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53 ISED RSS-GEN, Clause 6.6 FCC CFR 47 Part 2, Clause 2.1049

2.2.2 Date of Test and Modification State

11-March-2022 - Modification State 0

2.2.3 Test Equipment Used

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

2.2.4 Environmental Conditions

Ambient Temperature22.2°CRelative Humidity39.3%

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.

For 26 dB Bandwidth, in accordance with KDB 971168 D01, a peak detector and a trace setting of Max Hold were used. The trace was allowed to stabilise. Using the Spectrum Analyser function, the 26dB measurement result was obtained.

4.2 Occupied bandwidth – relative measurement procedure
The reference value is the highest level of the spectral envelope of the modulated signal, unless otherwise specified in an applicable rule section.
Subclause 5.4.3 of ANSI C63.26-2015 is applicable.

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

2.2.6 Test Results



Configuration 1

Maximum Output Power 37.00 dBm

			Result (kHz)						
Antenna	NR	NR Carrier	Channel F	Position B	Channel F	Position M	Channel F	Position T	
Antenna	Modulation	Bandwidth	Occupied	-26 dB	Occupied	-26 dB	Occupied	-26 dB	
			Bandwidth	Bandwidth	Bandwidth	Bandwidth	Bandwidth	Bandwidth	
A	QPSK	10.0 MHz 15 kHz SCS	9445.33	9798.53	9438.05	9807.44	9436.55	9801.18	
A	QPSK	15.0 MHz 15 kHz SCS	14344.81	14792.33	14350.47	14797.79	14343.55	14801.50	
A	QPSK	20.0 MHz 15 kHz SCS	19176.68	19743.80	19178.27	19746.44	19171.97	19753.03	

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

	ht Spectrum Analyzer - Occupied								
(X) RL Cente	r Freq 2.1150000			SENSE:EXT SOUR Center Fre	CE OFF ALI q: 2.115000000	GN AUTO		01:59:3 Radio Std:	88 PM Mar 11, 2022 None
Conte				 Trig: Free I #Atten: 14 	Run	Avg Hold: 1/	/1	Radio Devi	ce: BTS
10 dB/d	liv Ref 46.29 de	3m	1						
Log 36.3									
26.3		h.		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		~~~~~~	-4-		
16.3									
6.29									
-3.71									
-13.7									
-23.7	and have played and a south of the second						- tu	malunation	www.matter.ordt.co
-43.7									
	r 2.11500 GHz BW 100 kHz			#VB	W 300 kHz				n 20.00 MHz eep 20.02 s
Oc	cupied Bandwid	dth		Total P	ower	45.6 dB	ßm		
	9	9.4453	MHz						
Tra	nsmit Freq Error	3.6	617 kHz	% of OE	BW Power	99.00	%		
x di	B Bandwidth	9.7	99 MHz	x dB		-26.00 c	dB		
MSG						STATUS			
MSG						STATUS			



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

Keysight Spectrum Analyzer - Occupied BW				
	<u>CU</u> -	SENSE:EXT SOURCE OFF ALIC Center Freq: 2.145000000	GH7	02:09:22 PM Mar 11, 202 Radio Std: None
Center Freq 2.145000000	GHZ	💷 Trig: Free Run	Avg Hold: 1/1	
	#IFGain:Low	#Atten: 14 dB		Radio Device: BTS
10 dB/div Ref 46.50 dBm	1			
- og 36.5				
26.5	Λ		Λ	
	Important			
6.5				
.50				
50				
3.5				
3.5	N. M.		- Veran	ma Marsha a state
3.5 Marchine				mother and the mark the openation
3.5				
enter 2.14500 GHz				Span 20.00 Mi
Res BW 100 kHz		#VBW 300 kHz		#Sweep 20.02
Occupied Bandwidt	h	Total Power	45.7 dBm	
•	 4380 MHz			
9.4				
Transmit Freq Error	2.020 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	9.807 MHz	x dB	-26.00 dB	
G			STATUS	
9			314103	

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

Keysight Spi	ectrum Analyzer - Occupied I RF 50 Ω DC	BW		SENSE:EXT SOUR					02.17.1	1 PM Mar 11, 2022
	req 2.17500000	0 GHz		Center Free	q: 2.175000000	GN AUTO			Radio Std:	
		#	IFGain:Low	Trig: Free F #Atten: 14		Avg Hold: 1	/1		Radio Devid	e: BTS
10 dB/div	Ref 46.09 dB	m								
Log	Kei 40.09 uB	<u> </u>					<u> </u>			
36.1		h					Λ			
26.1						~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~			
6.09							1	ļ		
-3.91								<u> </u>		
-13.9								1		
-23.9								1		
-33.9 	a human in the second point of	w-enrol						TON BLAN	Lalant we again and all the	and the second sec
-43.9										
	17500 GHz									20.00 MHz
#Res BW	100 KHZ			#VB	W 300 kHz				#SWG	ep 20.02 s
Occu	pied Bandwid	lth		Total P	ower	45.5 dE	ßm			
	9	.4365	MHz							
Transr	nit Freq Error	-3.2	216 kHz	% of OE	BW Power	99.00	%			
x dB B	andwidth	9.8	01 MHz	x dB		-26.00	dB			
MSG						STATUS				



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

	nalyzer - Occupied BW								- 6
KIRL RF	50 Ω DC 2.117500000 G	·U~	SENSE:EXT SOUR	CE OFF ALI q: 2.117500000	GN AUTO			02:31:11 Radio Std: N	8 PM Mar 11, 2023
center Freq 2	2.117500000 G		🛶 Trig: Free I	Run	Avg Hold: 1/	1			
		#IFGain:Low	#Atten: 14	dB				Radio Devic	e: BTS
	tef 47.11 dBm								
37.1									
27.1		<u></u>			0.00-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-0-	Λ			
17.1									
7.11		{				1			
-2.89		{				}			
-12.9									
-72.9		1							
	and a factor on the factor of the	J.					mon	have been and share a	w march and the
-42.9									
-42.5									
Center 2.1175									30.00 MH
#Res BW 150	KHZ		#VB	W 470 kHz				#Swe	ep 20.02
Occupied	Bandwidth		Total P	ower	46.3 dB	m			
		345 MHz							
	14.	545 MITZ							
Transmit F	req Error	-3.922 kHz	% of OE	SW Power	99.00	%			
x dB Bandy	width	14.79 MHz	x dB		-26.00 d	в			
						-			
WSG					STATUS				
					0.11100				

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

Keysight Spec	trum Analyzer - Occupied BW RF 50 Ω DC			osuas parl cour	05.055				00.40.0	
	RF 50 Ω DC eq 2.145000000	GHz			q: 2.14500000	GN AUTO			Radio Std: N) PM Mar 11, 2022 lone
]	#1	FGain:Low	Trig: Free #Atten: 14		Avg Hold: 1	/1		Radio Devic	e: BTS
10 dB/div Log	Ref 48.00 dBm									
38.0		2					Λ			
28.0		1~	••••••	mar and a company to	mm	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-1			
18.0		1						l		
-2.00										
-12.0								1		
-22.0								1		
-32.0	and a market and a market	and						hanne	**********************	-where the second
-42.0										
Center 2.1	4500 GHz								Span	30.00 MHz
#Res BW	150 kHz			#VE	3W 470 kHz				#Śwe	ep 20.02 s
Occup	ied Bandwidth	ı		Total P	ower	46.2 dE	Bm			
	14	.350	MHz							
Transm	nit Freq Error	-5.4	30 kHz	% of O	BW Power	99.00	%			
	andwidth	14	B0 MHz	x dB		-26.00	dB			
		14.		A GE		20.00				
MSG						STATUS				



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

Keysight Spectrum Analyzer - Occupied BW	1			
Center Freg 2.172500000	GHz	Center Freq: 2.172500000		02:48:36 PM Mar 11, 202 Radio Std: None
	#IFGain:Low	, Trig: Free Run #Atten: 14 dB	Avg Hold: 1/1	Radio Device: BTS
10 dB/div Ref 48.00 dBn	1 <u>.</u>			
-og 38.0				
28.0	n		A	
8.0			man	
.00	1			
.00				
2.0				
2.0				
2.0 un tour un lan month	www.		him	where and any production and the second
2.0				
enter 2.17250 GHz				Span 30.00 Mł
Res BW 150 kHz		#VBW 470 kHz		#Sweep 20.02
Occupied Bandwidt	h	Total Power	46.1 dBm	
14	.344 MHz			
Transmit Freq Error	-10.395 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	14.80 MHz	x dB	-26.00 dB	
G			STATUS	

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

	ctrum Analyzer - Occupied BW									- 6 🗙
Center Fr	RF 50 Ω DC reg 2.120000000	GHz			q: 2.12000000	GN AUTO			Radio Std: I	0 PM Mar 11, 2022 None
	1			Trig: Free F #Atten: 12		Avg Hold:	1/1		Radio Devid	e: BTS
			Guilleon							
10 dB/div	Ref 47.25 dBm									
Log										
37.3		'n								
27.3		1 ~~		m	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-	1		
17.3		1						1		
7.25								1		
-2.75										
-12.8								1		
-22.8	untres and a second and a second	und						mours	anner and	ward marked
-52.0										and a short state of the state
-42.8										
	12000 GHz									40.00 MHz
#Res BW	200 kHz			#VB	W 620 kHz				#Swe	ep 20.02 s
Occur	oied Bandwidth	า		Total P	ower	46.5 d	Bm			
		.177	MHZ							
			WII 12							
Transn	nit Freq Error		737 Hz	% of OE	BW Power	99.00) %			
x dB B	andwidth	19.7	4 MHz	x dB		-26.00	dB			



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

Keysight Spectrum Analyzer - Occupied BW				
RL RF 50 Ω DC		SENSE:EXT SOURCE OFF ALIG	N AUTO	03:07:02 PM Mar 11, 202 Radio Std: None
Center Freq 2.145000000	GHZ		Avg Hold: 1/1	Radio Stu. None
	#IFGain:Low	#Atten: 12 dB		Radio Device: BTS
0 dB/div Ref 46.88 dBm 99 96.9 16.9 112				
3.1 3.1 3.1 3.1	star		imen	her allow some for some the second
enter 2.14500 GHz Res BW 200 kHz		#VBW 620 kHz		Span 40.00 Mł #Sweep 20.02
Occupied Bandwidth	ı	Total Power	46.5 dBm	
19	.178 MHz			
Transmit Freq Error	-280 Hz	% of OBW Power	99.00 %	
x dB Bandwidth	19.75 MHz	x dB	-26.00 dB	
G			STATUS	

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

Keysight Spec	trum Analyzer - Occupied BW RF 50 Ω DC			SENSE:EXT SOUR		GN AUTO			02-14-1	
	eq 2.170000000 (GHz		Center Fre	q: 2.17000000	GHz			Radio Std:	
]	#1	⊢ IFGain:Low	Trig: Free #Atten: 12		Avg Hold: 1	/1		Radio Devi	ce: BTS
10 dB/div Log	Ref 47.53 dBm									
37.5		<u>^</u>					~			
27.5		1	mmm	mar and the second s		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	~	l		
17.5 7.53										
-2.47										
-12.5								1		
-22.5								1		
-32.5 whereas	ration had marked	and						water	and have a street and and	and the man and the state of th
-42.5										
Center 2.1										n 40.00 MHz
#Res BW	200 kHz			#VE	3W 620 kHz				#Sw	eep 20.02 s
Occup	ied Bandwidth			Total P	ower	46.3 dE	Bm			
	19.	172	MHz							
Transm	nit Freq Error	.7 ()57 kHz	% of O	BW Power	99.00	%			
	andwidth		75 MHz	x dB		-26.00				
	anawian	19.		хuв		-20.00	uВ			
MSG						STATUS				



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 27, Clause 27.53 Industry Canada RSS-139, Clause 6.5 FCC CFR 47 Part 2, Clause 2.1051

2.3.2 Date of Test and Modification State

11-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 Temperature22.2°CRelative Humidity39.3%

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 dBm - 10 * Log (2) = -16 dBm.

2.3.6 Test Results

Configuration 1

Maximum Output Power 37.00 dBm

Antenna	NR Modulation	NR Carrier Bandwidth	Band Edge (MHz)				
Antenna		NR Camer Bandwidth	Channel Position B	Channel Position T			
A	QPSK	10.0 MHz 15 kHz SCS	2,115.0	2,175.0			
A	QPSK	15.0 MHz 15 kHz SCS	2,117.5	2,172.5			
A	QPSK	20.0 MHz 15 kHz SCS	2,120.0	2,170.0			



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

LXI RL	ectrum Analyzer - Swept SA RF 50 Ω DC req 2.110000000 GH	z	SENSE:EXT SOUP		IGN AUTO Avg Type: F	RMS	TF	3 PM Mar 11, 2022 RACE 1 2 3 4 5 6 TYPE WWWWW
10 dB/div	Ref Offset 41.46 dB Ref 35.46 dBm	PNO: Wide ↔ IFGain:Low	. Trig: Free #Atten: 10			MI Band F	kr1 2.109	950 GHz
	Kei 55.40 ubii			[
25.5								
15.5					\int	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
5.46								
-4.54								
-14.5				ļ,	p a la l			DL1 -16.01 dD
-24.5								
-34.5				/				
-44.5			-6 ¹	/				
-54.5	and the second and the second	www.www.www.www.www.www.www.						
Center 2. ⁻ #Res BW	110000 GHz 10 kHz	#VB	W 30 kHz*			#Swe	Span ep 20.02 s	2.000 MHz
WSG					STATUS			

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

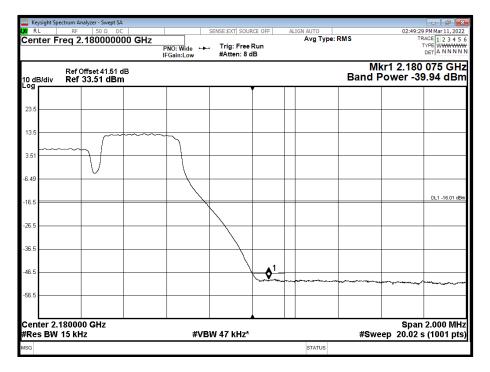
enter F	RF 50 Ω req 2.180000	000 GHz	PNO: Wide	SENSE:EXT SOU	Run	ALIGN AUTO Avg Typ	e: RMS	02.1	8:05 PM Mar 11, 2022 TRACE 1 2 3 4 5 TYPE WWWWW DET A N N N N
0 dB/div	Ref Offset 41.5 Ref 33.51 dE	1 dB	IFGain:Low	#Atten: 8 (dB		N Band	Ikr1 2.18 Power -	30 050 GH: 40.48 dBn
.°g									
23.5									
3.5									
	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		-						
.51		V							
.49			<u> </u>						
6.5			- Ny	4					DL1 -16.01 dB
0.5									
6.5									
6.5									
				$  \rangle$					
6.5				`	<b>Q</b> ¹	m			manum
6.5								-	
	180000 GHz 10 kHz		#VB	W 30 kHz*			#Sv	Sp: eep 20.0/	an 2.000 MH 2 s (1001 pts



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

Keysight Sp	ectrum Analyzer - Swept SA RF 50 Ω DC	SE	NSE:EXT SOUF		IGN AUTO		02:22:25	
	req 2.110000000 GHz		Trig: Free #Atten: 10	Run	Avg Type: F	8MS	TR	ACE 1 2 3 4 5 TYPE WWWWW DET A N N N N
10 dB/div	Ref Offset 41.46 dB Ref 35.46 dBm						kr1 2.109 Power -39	
25.5								
15.5								
5.46					$- \int$			
4.54							V	
14.5								DL1 -16.01 dD
24.5								
34.5				/				
44.5 54.5	man man and and and and and and and and and a			/				
							-	
Center 2. #Res BW	110000 GHz 15 kHz	#VBW	47 kHz*			#Swe	Span ep 20.02 s	2.000 MH s (1001 pts
ISG					STATUS			

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

Keysight Sp	ectrum Analyzer - Swept SA RF 50 Ω DC	CENCE-E	XT SOURCE OFF	LIGN AUTO		02:58:36 PM Mar 11, 2022
	req 2.110000000 GHz	PNO: Wide Tri	g: Free Run tten: 10 dB	Avg Type: RM		TRACE 1 2 3 4 5 TYPE WWWWW DET A NNNN
10 dB/div	Ref Offset 41.46 dB Ref 35.46 dBm				Mkr Band Po	1 2.109 900 GH wer -38.67 dBn
25.5						
15.5						
5.46						
4.54						
.14.5						DL1 -16.01 dE
24.5			,			
34.5						
44.5			▲1			
54.5						
Center 2. Res BW	110000 GHz 20 kHz	#VBW 62	kHz*		#Sweep	Span 2.000 MH 20.02 s (1001 pt
ISG				STATUS		

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

		PNO: Wide ++ FGain:Low	#Atten: 10	dB				DETANNNN
0 dB/div	Ref Offset 41.51 Ref 35.51 dB	1		•		Mki Band Po	1 2.180 ower -39	100 GH: .38 dBn
25.5								
5.5								
.51	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~							
.49								
4.5		$\mathbf{N}$						
4.5								DE1-10.01 GD
			$\backslash$					
4.5								
4.5				<b>0</b>	an and a sub-			
4.5								
	180000 GHz 20 kHz	#\/P	W 62 kHz*	•	I	# <b>O</b> wee	Span : p 20.02 s	2.000 MH



#### 2.4 TRANSMITTER SPURIOUS EMISSIONS

#### 2.4.1 Specification Reference

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

#### 2.4.2 Date of Test and Modification State

11-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 Temperature22.2°CRelative Humidity39.3%

#### 2.4.5 Test Method

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

Each antenna port has been declared as being equivalent, therefore measurements were made on one antenna port only. To account for this, the limit was tightened by 10 * 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 (2) = -16 dBm.

#### 2.4.6 Test Results

**Configuration 1** 

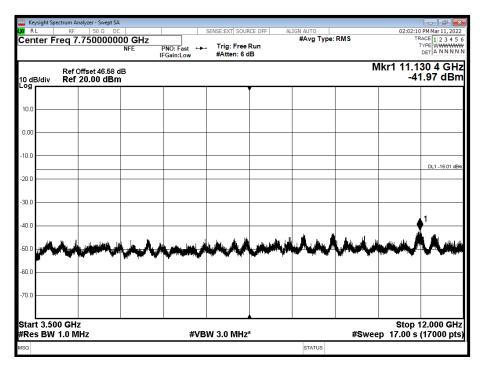
Maximum Output Power 37.00 dBm



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

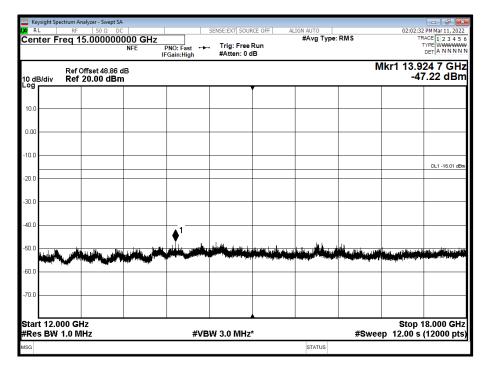
		trum Analyzer - S								
XI RL			Ω DC 04500 GHz		SENSE:EXT SOUR	CE OFF AL	IGN AUTO #Avg Type:	RMS		PM Mar 11, 2022
Cen		eq 1.7500	NFE	PNO: Fast ++ IFGain:Low	. Trig: Free #Atten: 10		#rig ()pc.		Т	YPE WWWWWW DET A NNNN
10 dE Log r		Ref Offset 4 Ref 41.82							Mkr1 2.1 [.] 28	19 3 GH: 3.75 dBm
_							<b>▲</b> 1			
31.8							• ·			
21.8										
11.8										
1.82										
8.18							1			
-18.2										DL1 -16.01 dB
-28.2										
-38.2										
48.2							N.			
	a din din takan kara	المتعالية والمتعالية	والأفار والتوادية والمساد	ومقرعه الأول واداريت المحمد			n Annaldar på lande		istik an an air	
	t 9 kHz			#VB	W 3.0 MHz			#Swe	Stop ep 7.000 s	3.500 GH: (7000 pts
ISG							STATUS		-	· ·

Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B - Band 2 - Range 3500 to 12000 MHz

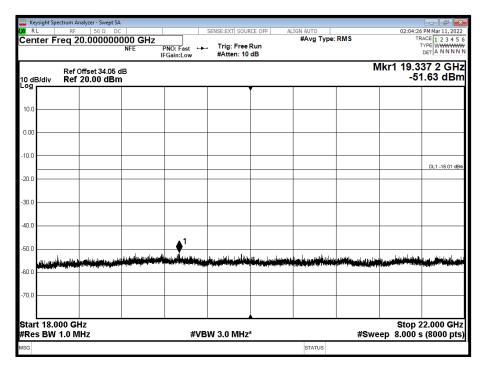




#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B - Band 3 - Range 12000 to 18000 MHz



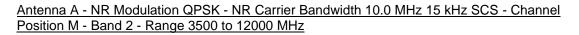
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position B - Band 4 - Range 18000 to 22000 MHz

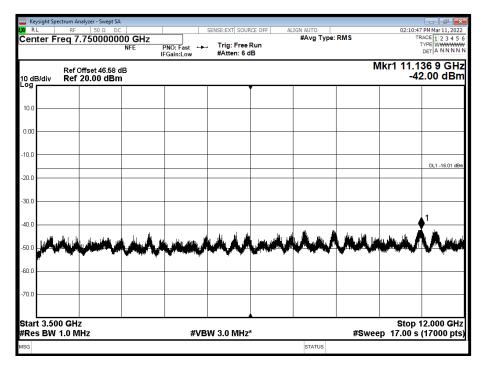




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

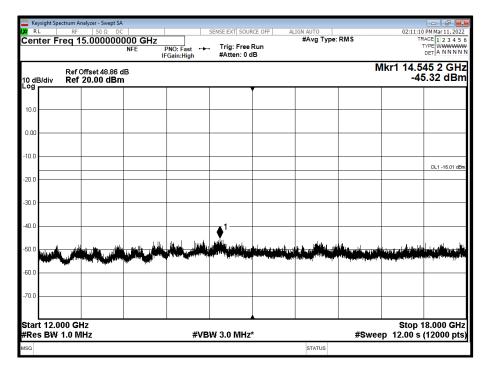
			nalyzer - Swept									
XI RL		RF		DC		SENSE:EXT SOUR	RCE OFF AL		I AUTO #Avg Type:	DMC		5 PM Mar 11, 2022
Cen	ter Fi	req 1	.750004	500 GHz	PNO: Fast ++	. Trig: Free	Run		#Avg Type:	RIVIS		TYPE WWWWW
					IFGain:Low	#Atten: 10	dB					DETANNN
			Offset 42.22								Mkr1 2.1	
10 dE Log	3/div	Ref	42.22 dB	m							28	3.74 dBn
32.2									1			
								IT				
22.2								H				
12.2								$\  \ $				
2.22								$\mathbb{H}$				
-7.78								H				
								Ш				DL1 -16.01 dBr
-17.8								Ħ				
-27.8												
-21.0												
-37.8								Ľ				
									1			
-47.8								ľ	۱			
				والمحدد أفقار والمراجع	وليعدد المانية والمرابي	الرفيل وطافعته المربع بد	والأعرب والمعصورة والمتلا	1	international and	المدينا ومطلوع وجوارية والدرا	البراميلية ويترارك ومراركة ومراركة المراركة ومراركة المراركة ومراركة ومراركة ومراركة ومراركة ومراركة ومراركة و مراركة مراركة	
	_{ئانىل} ەردىنى t 9 kH		د) <del>دار در کار در ار</del>	the continues of the	an a	and the second	and the first second second				 C#	2 500 011
	t9 κ⊓ sBW/		Hz		#VB	W 3.0 MHz	*			#Swe	ep 7.000 stop	3.500 GHz (7000 pts
ISG								_	STATUS			- 1 2 <b>0 p</b>



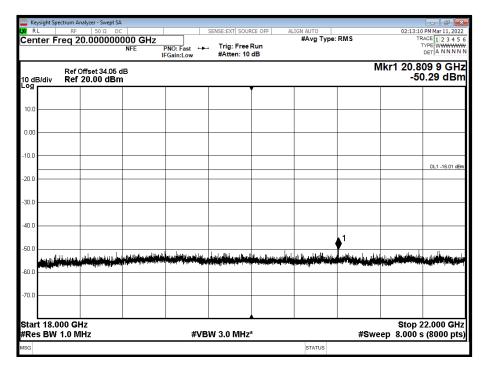




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 4 - Range 18000 to 22000 MHz

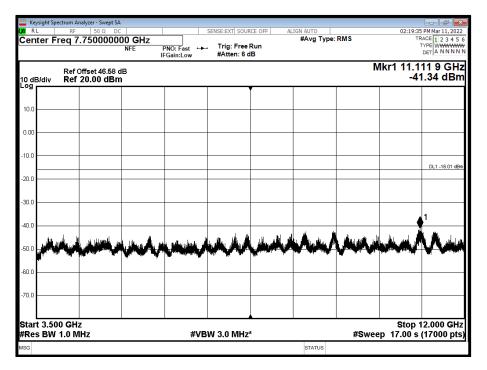




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

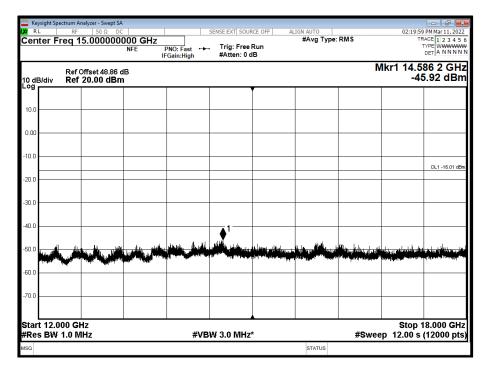
		Analyzer - Swept S									
X RL	R				SENSE:EXT SOUR	ALCE OFF AL		AUTO	DMS		5 PM Mar 11, 2022
Cente	er ⊢req	1.7500045	NFE F	NO: Fast	. Trig: Free #Atten: 10		•	wy type.	RWS		TYPE WWWWW DET A NNNN
10 dB/		f Offset 42.22 f <b>41.57 dB</b> i								Mkr1 2.1 28	70 8 GH: 8.41 dBm
Log											
31.6								¹			
21.6											
11.6											
1.57 —											
-8.43 —											
-18.4		_									DL1 -16.01 dB
-28.4											
-38.4											
							W				
-48.4		. را به بولما بر الدر بولما بر	وروال ومعقاقها والعربان	أعنيها والتشالية والمستنفية	فاللافا ويوافعها لرحة	والم وموانع الماني والم	ľ	Lingen altin faith			
	9 kHz BW 1.0	the first state	en hejjin er aldikisiken, eld.	#VB	W 3.0 MHz	*	<u> </u>		#Swe	Stop ep 7.000 s	3.500 GHz
WSG				<i>".</i> υ				STATUS	<i>"</i> онс		pic

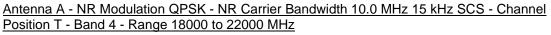
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position T - Band 2 - Range 3500 to 12000 MHz

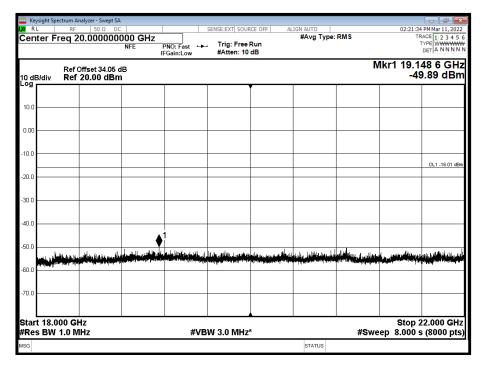




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position T - Band 3 - Range 12000 to 18000 MHz





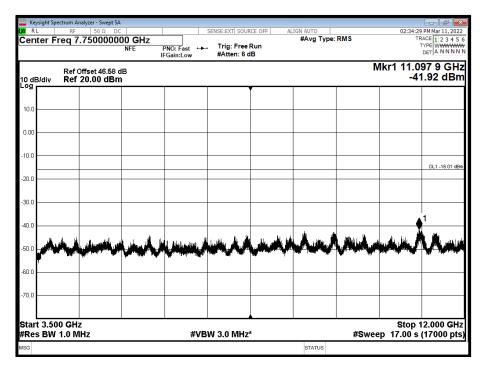




Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

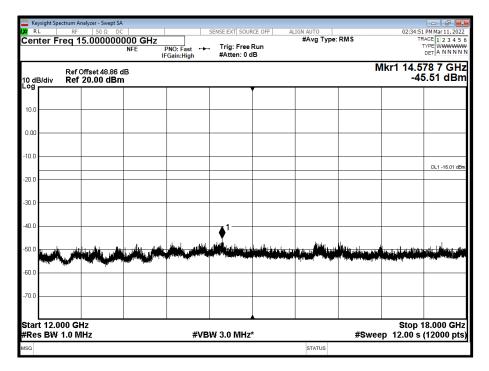
		nalyzer - Swept S/								
Cente	er Frea 1	50 Ω DO			SENSE:EXT SOUR		IGN AUTO #Avg Type:	RMS	TR	PM Mar 11, 2022 ACE 1 2 3 4 5 6
			NFE F	NO: Fast ++	. Trig: Free #Atten: 10				T	DET A N N N N
10 dB/c		Offset 42.22 ( 38.95 dBn							Mkr1 2.1 28	24 3 GHz 3.33 dBm
							<b>1</b>			
29.0										
19.0										
8.95										
-1.05 —										
-11.1										
										DL1 -16.01 dBm
-21.1										
-31.1										
-41.1							1)			
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-51.1		, and the lating of the lating	en ta tel de ser a tel de ser a s	ela pinten al antica de la companya	anı afi ta iti diatan Mana	Notice and the second second		li togli i i po		
Start 9 #Res I	9 kHz BW 1.0 N	/Hz	·	#VB	W 3.0 MHz	*		#Swe	Stop ep 7.000 s	3.500 GHz (7000 pts)
MSG							STATUS			

Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B - Band 2 - Range 3500 to 12000 MHz

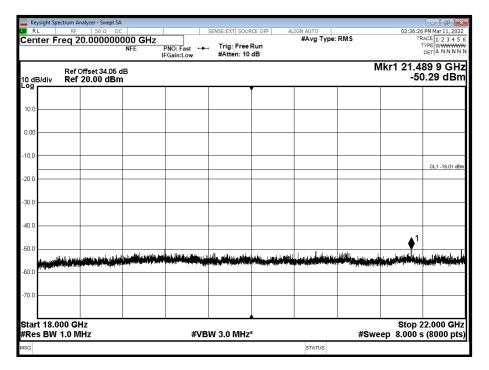




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position B - Band 4 - Range 18000 to 22000 MHz

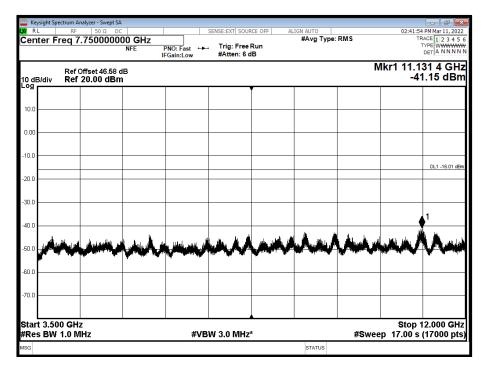




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

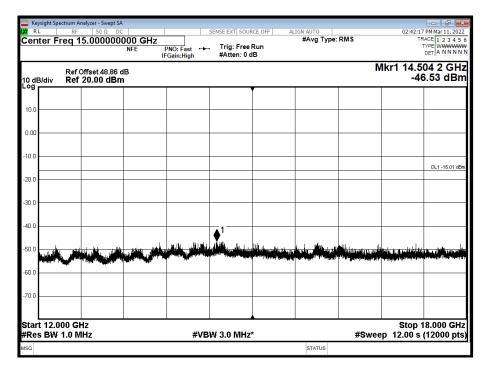
🛄 Kej LXI R		trum Ar RF	alyzer - Swep	DC		SENSE:EXT SOUR	05.055	1011	AUTO		00.40.50	PM Mar 11, 2022
				4500 GHz		SENSE:EXT  SOUR	(CEOFF AL		Avg Type:	RMS		ACE 1 2 3 4 5 6
001		oq i	.10000-	NFE	PNO: Fast ++ IFGain:Low	. Trig: Free #Atten: 10			• //			
10 dE Log	B/div		)ffset 42.2 38.12 dl								Mkr1 2.1 28	38 3 GHz 3.12 dBm
_								<b>▲</b> 1				
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18.1												
8.12	<u> </u>	_										
-1.88												
-11.9												DL1 -16.01 dBr
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-31.9												
-41.9												
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	t9 kHz sBW 1		Hz		#VB	W 3.0 MHz	*			#Swe	Stop ep 7.000 s	3.500 GHz (7000 pts)
MSG									STATUS			

# Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position M - Band 2 - Range 3500 to 12000 MHz

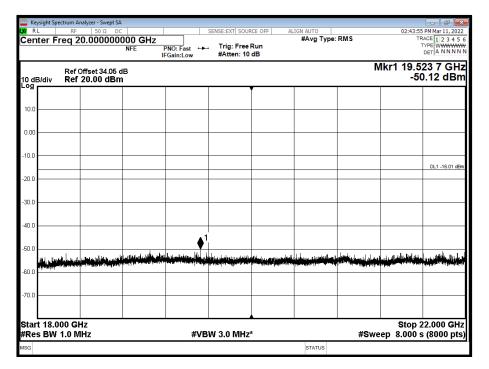




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position M - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position M - Band 4 - Range 18000 to 22000 MHz

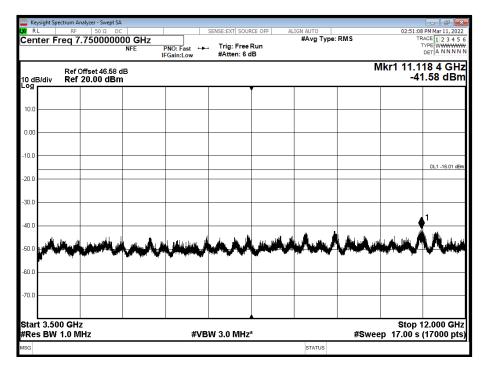




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

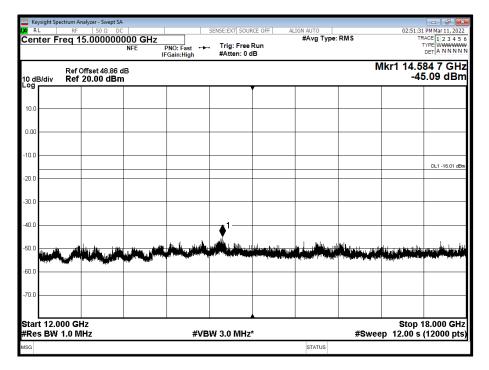
Kej		ctrum Ar RF	alyzer - Swep 50 Ω			SENSE:EXT SOU	RCE OFF AL	IGN	AUTO		02:50:15	PM Mar 11, 2022
				500 GHz	PNO: Fast		Run		Avg Type:		TF	ACE 1 2 3 4 5 TYPE WWWWW DET A N N N N
10 dE Log	B/div		offset 42.2 37.80 dE								Mkr1 2.1 28	65 8 GH: 3.31 dBn
27.8									1			
17.8												
7.80												
-2.20												
-12.2												DL1 -16.01 dB
-22.2												
-32.2												
-42.2								K			Ib. A rat	at analysis as a
-52.2	i seli de la					. Jean se skala ji Jilde ji Baratik Manga Pangarana Pangala Ji						and the second second second
	t9 kH sBW		Hz		#VB	W 3.0 MHz	*			#Swe	Stop ep 7.000 s	3.500 GHz 5 (7000 pts
MSG									STATUS			

# Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T - Band 2 - Range 3500 to 12000 MHz

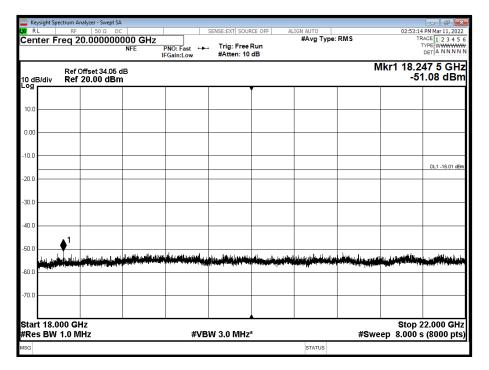




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 15.0 MHz 15 kHz SCS - Channel Position T - Band 4 - Range 18000 to 22000 MHz

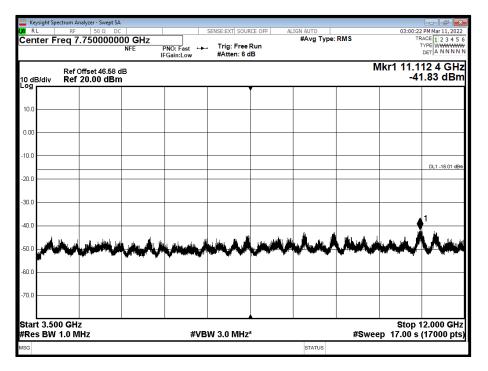




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B - Band 1 - Range 0.009 to 3500 MHz

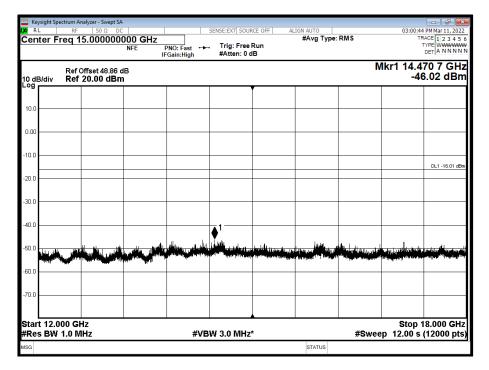
		n Analyzer - Swept								- 6 -
Cen		⊮ <u>50 Ω</u> 1.750004			SENSE:EXT SOUR	CE OFF AL	IGN AUTO #Avg Type	RMS		PM Mar 11, 2022
Cell		1.7 50004	NFE F	NO: Fast ↔ Gain:Low	Trig: Free #Atten: 8 d				1	
10 dE Log		ef Offset 42.2 ef 36.82 dE							Mkr1 2.1 28	29 3 GHz 3.33 dBm
LOg							<b>♦</b> ¹			
26.8							Ľ			
16.8										
6.82										
-3.18										
-13.2										DL1 -16.01 dBm
-23.2										
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-43.2										
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		الالبادا المادار والم						a filma anticipita anticata	a territori de la construcción de l	and the second
	t9 kHz sBW 1.0	MHz		#VB	W 3.0 MHz	•		#Swe	Stop ep 7.000 s	3.500 GHz (7000 pts)
MSG							STATUS			

Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B - Band 2 - Range 3500 to 12000 MHz

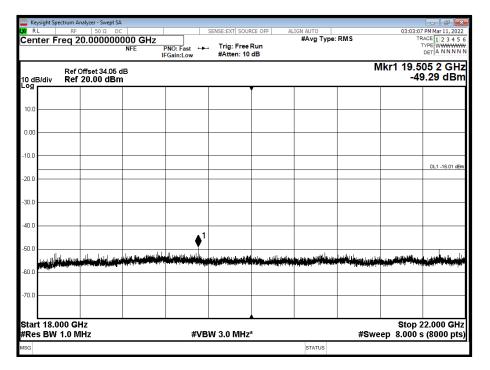




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position B - Band 4 - Range 18000 to 22000 MHz

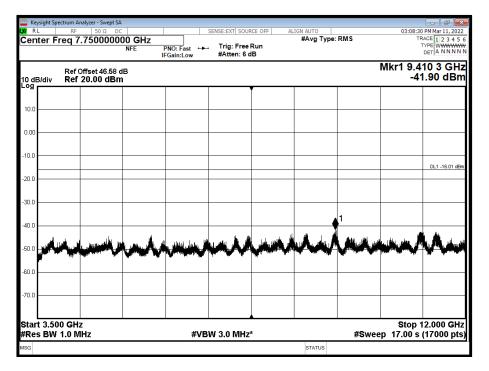




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M - Band 1 - Range 0.009 to 3500 MHz

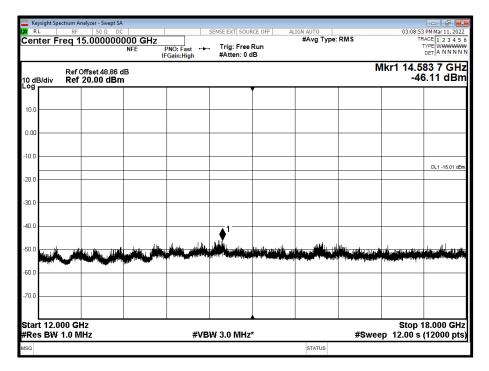
			alyzer - Swept									
XI R		RF		DC		SENSE:EXT SOUR	AL	IGN	AUTO #Avg Type:	DMC		PM Mar 11, 2022
Cen	nter Fr	eq 1.	750004	500 GHz		Trig: Free	Run	•	#Avg Type:	RIVIS		ACE 1 2 3 4 5
					NO: Fast ++	#Atten: 10						DET A NNNN
											Mkr1 2.1	35.8 GH
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17.3								Π				
7.31												
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Star	t9 kHz	,					•			1	Ston	3.500 GHz
	s BW 1		Hz		#VB	W 3.0 MHz	*			#Swe	ep 7.000 s	
ISG									STATUS			
DOW									STATUS			

Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M - Band 2 - Range 3500 to 12000 MHz

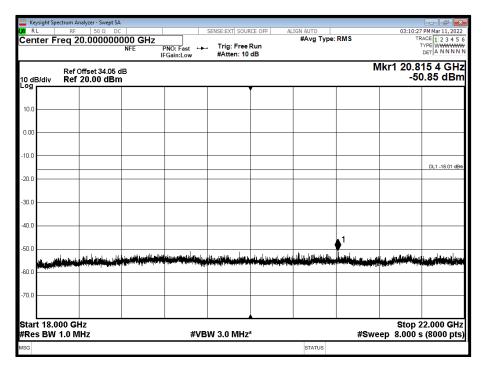




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M - Band 3 - Range 12000 to 18000 MHz



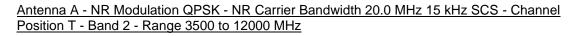
Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position M - Band 4 - Range 18000 to 22000 MHz

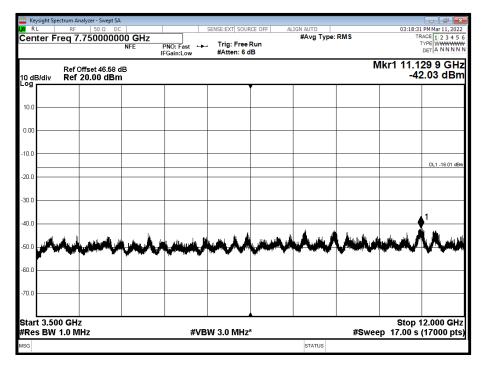




## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T - Band 1 - Range 0.009 to 3500 MHz

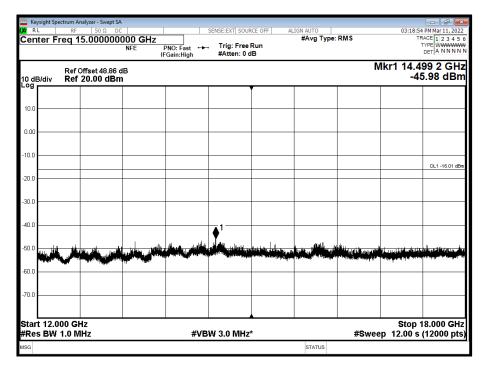
		m Analyzer - Swe									
X/R Cen		RF 50 Ω	4500 GHz		SENSE:EXT SOU	RCE OFF AL		AUTO #Avg Type:	RMS		PM Mar 11, 2022
0011		1 1.70000	NFE	PNO: Fast ↔ FGain:Low	. Trig: Free #Atten: 8 d			• //		1	
10 dE Log		ef Offset 42. ef 35.17 d								Mkr1 2.1 28	60 8 GH: 3.38 dBm
LUg								1			
25.2							H	l			
15.2				1					<u></u>		
5.17											
-4.83											
-14.8											DL1 16.01 dB
-24.8											
-34.8											
-44.8							Ł				
-54.8								المانية متدار بال	light to define the	ومعاقفا المعاد والمرامي	المراجع المراجع
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	L		I		W 3.0 MHz	*	I		# <b>6</b>		3.500 GHz
#Re:	S DW 1.			#VB	WV J.U IVIHZ			STATUS	#Swe	ep 7.000 s	s (7000 pts
Den								STATUS			







## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T - Band 3 - Range 12000 to 18000 MHz



Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 20.0 MHz 15 kHz SCS - Channel Position T - Band 4 - Range 18000 to 22000 MHz

RL	RF				SENSE:EXT SOUR	RCE OFF AL	IGN AUTO			PM Mar 11, 202
ente	er Freq 2	20.000000	000 GHz	PNO: Fast 🔸	. Trig: Free	Run	#Avg Type:	RMS	1	ACE 1 2 3 4 5
				FGain:Low	#Atten: 10					DET A NNNN
	Pef	Offset 34.05 c	18					Ν	1kr1 21.7	67 0 GH:
) dB/		f 20.00 dBm							-51	l.09 dBn
°ªΓ						(				
0.0										
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										DL1 -16.01 dB
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			and a state of the second s	Allow a loss with		a la		a di bili bin di di Barina. Parte di Pangangan panganan		
0.0 F	-1									
0.0										
	18.000 G								Stop 2	2.000 GH
Dac	BW 1.0 M	/IHz		#VB	W 3.0 MHz	*		#Swe	ep 8.000 s	; (8000 pts

Limit FCC Part 27.53 (a - j) and RSS-139 Clause 6.6

Limit The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) db.



#### 2.5 RADIATED EMISSIONS

#### 2.5.1 Specification Reference

ISED RSS-GEN, Clause 6.3 Industry Canada RSS-139, Clause 6.6 FCC CFR 47 Part 2, Clause 2.1053

#### 2.5.2 Date of Test and Modification State

04-April-2022 - Modification State 0

#### 2.5.3 Test Equipment Used

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

#### 2.5.4 Environmental Conditions

Ambient Temperature21.4°CRelative Humidity37.9%

#### 2.5.5 Test Method

The test was performed in accordance with ANSI C63.26 Clause 5. The EUT was configured as defined in ANSI C63.26, clause 5.5.2.3.2.

As a result of the conducted measurements that were performed on the EUT, it was established that 10 MHz was the bandwidth configuration which gave the highest output power and therefore deemed to be worst case operating mode. Testing was performed on the Top, Middle and Bottom channels.

The EUT was set up on a support replicating typical installation conditions at a height of 0.8 m above the reference ground plane for measurements below 1GHz, (see setup photos) within a semi-anechoic chamber on a remotely controlled turntable. Above 1 GHz, the height was increased to 1.5 m above the reference ground plane.

Pre-scan and final measurements were made using a Field Strength method in accordance with ANSI C63.26 Clause 5.5.4. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification. Final results were then converted to eirp and are displayed in the plots below. The correction for field strength measurements to eirp at 3 m was 95.2 dB. An RBW of 1 MHz and VBW of 3 MHz was used for all measurements with a Peak detector and trace set to Max Hold. In all cases below where the limit line is exceeded – this is the intentional transmit frequency.

## 2.5.6 Test Results



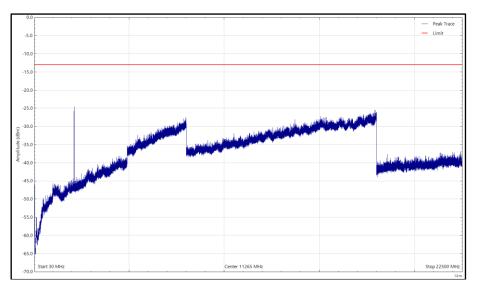
Configuration 1

Maximum Output Power 37.00 dBm

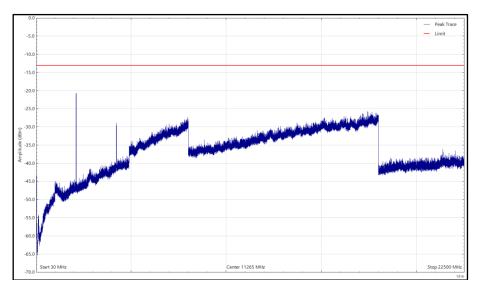
Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Bot - NR&NB-IoT - B66A, 2115MHz, 30 MHz to 22.5 GHz

*No emissions found within 6 dB of the limit.



Bot - NR&NB-IoT - B66A, 2115MHz, 30 MHz to 22.5 GHz, Horizontal (Peak)



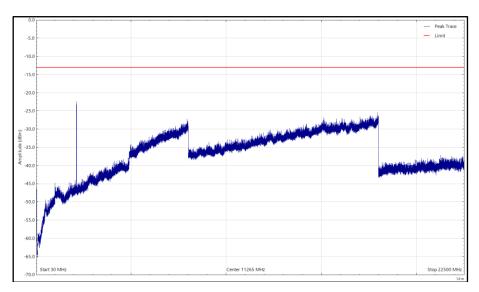
Bot - NR&NB-IoT - B66A, 2115MHz, 30 MHz to 22.5 GHz, Vertical (Peak)



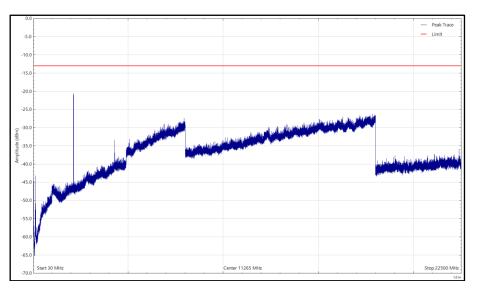
Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Mid - NR&NB-IoT - B66A, 2145MHz, 30 MHz to 22.5 GHz

*No emissions found within 6 dB of the limit.



Mid - NR&NB-IoT - B66A, 2145MHz, 30 MHz to 22.5 GHz, Horizontal (Peak)



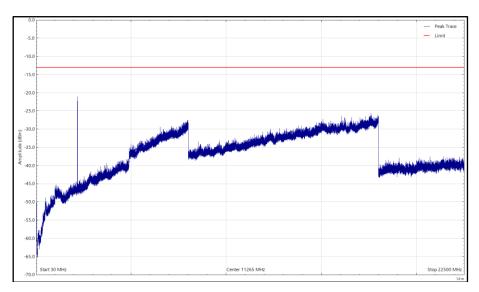
Mid - NR&NB-IoT - B66A, 2145MHz, 30 MHz to 22.5 GHz, Vertical (Peak)



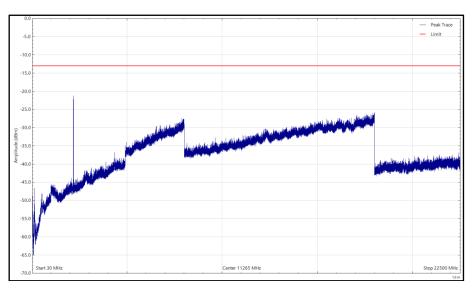
Frequency (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector	Angle (°)	Height (cm)	Polarisation
*							

Top - NR&NB-IoT - B66A, 2175MHz, 30 MHz to 22.5 GHz

*No emissions found within 6 dB of the limit.



Top - NR&NB-IoT - B66A, 2175MHz, 30 MHz to 22.5 GHz, Horizontal (Peak)



Top - NR&NB-IoT - B66A, 2175MHz, 30 MHz to 22.5 GHz, Vertical (Peak)



No emissions were detected within 6dB of the limits however the highest emissions for each Band has been recorded below.

	Channel Frequency		Angle	Height	Frequency	Level
Channel/Band	(MHz)	Polarisation	(°)	(cm)	(MHz)	(dBm)
Bot - B66A	2115MHz	Horizontal	0	155	2119.187	-24.51
Mid – B66A	2145MHz	Horizontal	0	155	17951.492	-25.42
Top – B66A	2175MHz	Horizontal	0	155	17600.433	-25.55

Limit -13dBm
--------------



**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					1
Hygrometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Analyser	Keysight	N9030A	4654	12	24-Nov-2022
AC Power Supply	iTech	IT7324	5227	-	OP-MON
Multimeter	Fluke	79	0611	12	21-Dec-2022
Attenuator	Weinschel	48-40-43-LIM	5134	12	05-Jan-2023
Network Analyser	Keysight	N5235B	5361	12	29-Jun-2022
Occupied Bandwidth					
Hygrometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Analyser	Keysight	N9030A	4654	12	24-Nov-2022
AC Power Supply	iTech	IT7324	5227	-	OP-MON
Multimeter	Fluke	79	0611	12	21-Dec-2022
Attenuator	Weinschel	48-40-43-LIM	5134	12	05-Jan-2023
Network Analyser	Keysight	N5235B	5361	12	29-Jun-2022
Band Edge				1	
Hygrometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Analyser	Keysight	N9030A	4654	12	24-Nov-2022
AC Power Supply	iTech	IT7324	5227	-	OP-MON
Multimeter	Fluke	79	0611	12	21-Dec-2022
Attenuator	Weinschel	48-40-43-LIM	5134	12	05-Jan-2023
Network Analyser	Keysight	N5235B	5361	12	29-Jun-2022
Transmitter Spurious Er	missions		•		
Hygrometer	PCE Instruments	PCE-THB-40	5475	12	06-Apr-2022
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	30-Jun-2022
Analyser	Keysight	N9030A	4654	12	24-Nov-2022
AC Power Supply	iTech	IT7324	5227	-	OP-MON
Multimeter	Fluke	79	0611	12	21-Dec-2022
Attenuator	Weinschel	48-40-43-LIM	5134	12	05-Jan-2023
Network Analyser	Keysight	N5235B	5361	12	29-Jun-2022
HPF	Advance Power Components	11SH10- 3000/X18000-O/O	4411	12	02-Jul-2022
Waveguide filter	Quasar	QWS20SB-UBR- UBR-50	5789	12	04-May-2022



Instrument	Manufacturer	Туре No.	TE No.	Calibration Period (months)	Calibration Due
WG20 Coaxial Adapter	Quasar	QWC20SB-UBR-K-F	5785	-	OP-MON
WG20 Coaxial Adapter	Quasar	QWC20SB-UBR-K-F	5786	-	OP-MON
Cable attenuator	Aralab	CSF6767C-C2S6500	5175	-	OP-MON
Radiated Emissions					-
Antenna (DRG, 18 GHz to 40 GHz)	Link Microtek Ltd	AM180HA-K-TU2	230	24	27-Jul-2022
Antenna with attenuator (Bilog, 30 MHz to 3 GHz)	Schaffner	CBL6143	287	24	14-Oct-2022
Comb Generator	Schaffner	RSG1000	3034	-	TU
Emissions Software	TUV SUD	EmX V2.1.11 V.2.1.11	5125	-	Software
Cable (N-Type to N- Type, 8 m)	Teledyne	PR90-088-8MTR	5450	6	01-Apr-2022
Antenna (DRG, 7.5 GHz to 18 GHz)	Schwarzbeck	HWRD750	5610	12	15-Oct-2022
Turntable & Mast Controller	Maturo Gmbh	NCD/498/2799.01	5612	-	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	5613	-	TU
Turntable	Maturo Gmbh	Turntable 1.5 SI-2t	5614	-	TU
Screened Room (12)	MVG	EMC-3	5621	36	11-Aug-2023
EMI Test Receiver	Rohde & Schwarz	ESW44	5912	12	17-Feb-2023
Thermo-Hygro Barometer	PCE Instruments	PCE-THB-40	5605.00	12.00	23-Sep-2022
Antenna DRG 1-18 GHz	ETS-Lindgren	3117.00	4722.00	12.00	11-Mar-2023
Power Source	PDS Instruments	31020-00071	4133.00	TU	O/P Mon
Multimeter	Fluke	177.00	3832.00	12.00	08-Jul-2022
Power Supply	Farnell	H 60/50	1095.00	TU	O/P Mon

N/A – Not Applicable O/P Mon – Output Monitored with Calibrated Equipment TU – Traceability Unscheduled



# 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	9 kHz to 40 GHz Amplitude	± 1.0 dB
Conducted Emissions	9 kHz to 40 GHz Amplitude	± 3.5 dB
	10 MHz Bandwidth	± 16.7 kHz
Occupied Bandwidth	15 MHz Bandwidth	
	20 MHz Bandwidth	
Band Edge	< 3.6 GHz Amplitude	± 0.6 dB
	30 MHz to 1 GHz	± 5.2 dB
Radiated Spurious Emissions	1 GHz to 40 GHz	± 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. (Procedure 2). The measurement results are directly compared with the test limit to determine conformance with the requirements of the standard.

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



# 3.3 MEASUREMENT SOFTWARE USED

List of measurement software versions used for testing.

Instrument	Manufacturer	Type No.	TE No.	Software Version
Network Analyser	Keysight	N5235B	5361	A.22.08
HP-VEE Software	TUV SUD	HP_VEE	N/A	V3.29
Emissions Software	TUV SUD	EmX	5125	V.2.1.11



**SECTION 4** 

# ACCREDITATION, DISCLAIMERS AND COPYRIGHT



# 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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

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

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Postal Address: Djäknegatan 31, 211 35, Malmo, Sweden Postal Address :Octagon House, Concorde Way, Fareham, Hampshire, UK, PO15 5RL



ANNEX A

MODULE LIST



Configuration A				
Product	Product No	R-State	Serial No	
Radio 2203 B66A	KRC 161 553/1	R1E	C82A558731	
Software Version:	CXP9013268/9	Revision:	R84JD	