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Report On

FCC and ISED Testing of the Ericsson Radio 4478 B14, KRC 161 669/3, NR (700 MHz), in a Base Station configuration in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 90 COMMERCIAL-IN-CONFIDENCE

FCC: TA8AKRC161669-3

PREPARED BY

1744Atuh

Maggie Whiting Key Account Manager

**APPROVED BY** 

DATED

Steve Scarfe Authorised Signatory 04 January 2021

Document 75950227 Report 06 Issue 2

January 2021



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**SECTION 1** 

**REPORT INFORMATION** 



## 1.1 REPORT DETAILS

Manufacturer	Ericsson AB
Address	Torshamnsgatan 23 Kista SE-16480 Stockholm Sweden
Product Name & Product Number	Radio 4478 B14 & KRC 161 669/3
IC Model Name	AS161669
Serial Number(s)	D16X143630
Software Version	CXP9013268/15 Rev R84FJ
Hardware Version	R1C
Non-Tested Variant	Radio 4478 B14 & KRC 161 669/1
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2019 FCC CFR 47 Part 90: 2019
Test Plan	Q4 FCC_IC test plan for NR legacy
Start of Test	11 November 2020
Finish of Test	11 November 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 2: 2019, FCC CFR 47 Part 90: 2019The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

Neil Rousell

This Report has been up issued to Issue 2 and should be read in place of Issue 1. This Report has been up issued to Issue 2 to change the Rule Parts and add an updated Declaration of Build Status



## 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 90 is shown below.

		Specification Clause		
Section	FCC CFR 47 Part 2	FCC CFR 47 Part 90	Test Description	Result
-	-	-	Equivalent Isotropically Radiated Power (EIRP)	N/A <sup>1</sup>
2.1	2.1046	90.542	Broadband Transmitting Power Limits	Pass
2.2	2.1049	-	Occupied Bandwidth	Pass
2.3	2.1051	90.543	Band Edge	Pass
2.4	2.1051	90.543	Transmitter Spurious Emissions	Pass

 $N/A^1 - Not$  Applicable, due to no integral antenna N/A - Not Applicable

This unit was tested without an antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible IC Bureau(s). Licensees are required to take into account the maximum allowed antenna gain used in combination with the power settings to prevent the radiated output power exceeding the limits.



## 1.3 CONFIGURATION DESCRIPTION

Configuration	ration RAT No. Of Car		Carrier Bandwidth	Carrier Frequency Configuration (MHz)		
Comgulation	carriers		Bottom	Middle	Тор	
A1	NR	1	5 MHz – SCS 15kHz	760.5	763.0	765.5
	NR	1	10 MHz – SCS 15kHz	-	763.0	-



## 1.4 DECLARATION OF BUILD STATUS

MAIN EUT	
MANUFACTURING DESCRIPTION	Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	Radio 4478 B14
PART NUMBER	KRC161699/3
	KRC161699/1
IC MODEL NUMBER	AS161669
SERIAL NUMBER	D16X143630
HARDWARE VERSION	R1C
SOFTWARE VERSION	CXP9013268/15 Rev R84FJ
TRANSMITTER OPERATING RANGE	B14: 758-768 MHz (DL)
	788 -798 MHz (UL)
MODULATIONS	LTE & NR: QPSK, 16QAM, 64QAM, 256QAM
ITU DESIGNATION OF EMISSION	LTE 5 MHz BW channel: 5M00W7D
	LTE 10 MHz BW channel: 10M0W7D
	NR 5 MHz BW channel:4M47W7D
	NR 10 MHz BW channel: 9M29W7D
OUTPUT POWER (RMS) (W or dBm)	4 ports, 40W per port
FCC ID	TA8AKRC161669-3
IC ID	287AB-AS1616693
TECHNICAL DESCRIPTION	Base station radio
(a brief description of the intended use	
and operation)	

Signature

Faysal Pirmohamed

Faysal Pirmohamed

Date

2020-12-16

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

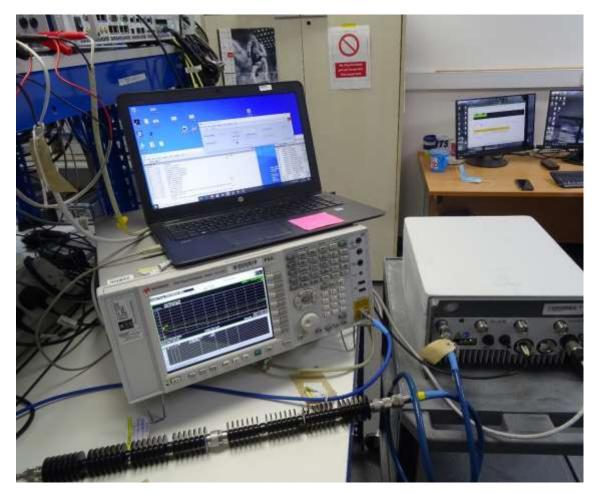


## 1.5 **PRODUCT INFORMATION**

#### 1.5.1 Technical Description

The Equipment Under Test (EUT) Radio 4478 B14 is an Ericsson AB Radio Unit working in the public mobile service 700 MHz band which provides communication connections to 700 MHz network. The Radio 4478 B14 operates from a -48V DC supply.

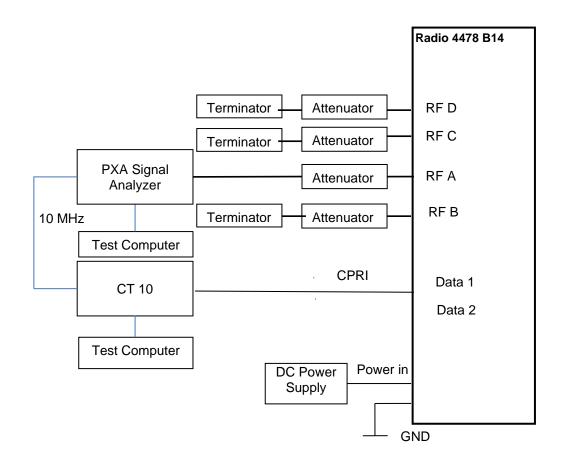
The Equipment Under Test (EUT) is shown in the photograph below. A full technical description can be found in the Manufacturer's documentation.



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

Test Name	Name of Engineer(s)
Broadband Transmitting Power Limits	Neil Rousell
Occupied Bandwidth	Neil Rousell
Band Edge	Neil Rousell
Transmitter Spurious Emissions	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.



**SECTION 2** 

**TEST DETAILS** 



### 2.1 BROADBAND TRANSMITTING POWER LIMITS

#### 2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046 FCC CFR 47 Part 90, Clause 90.542

#### 2.1.2 Date of Test and Modification State

11 November 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	23.4°C
Relative Humidity	53.2%

#### 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 A1** 

Maximum Output Power 46 dBm

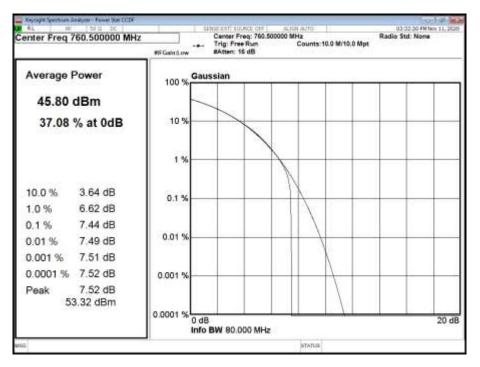
		NR Carrier Bandwidth	Peak to Average Ratio (PAR) / Output Power				
	NR Modulation		Channel Position B				
Antenna			PAR (dB)	Averaç	Total Power Ports A + B + C+ D		
				dBm	dBm/MHz	dBm	
A	QPSK	5.0 MHz 15 kHz SCS	7.44	45.93	39.95	51.95	

#### **Remarks**

Calculations: Total power = measured output power (port A, worst case) +  $10\log(4)$  and PSD = measured output power -  $(10*\log(OBW/1MHz))$ .



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



#### Configuration A1

Maximum Output Power 46 dBm

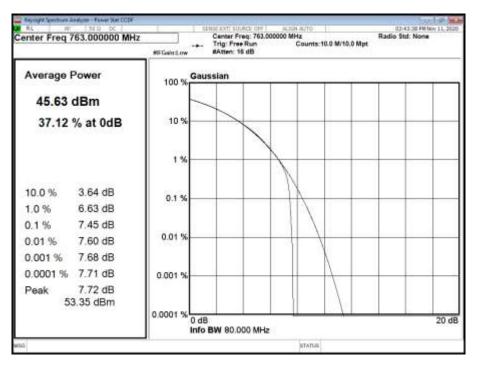
			Peak to Average Ratio (PAR) / Output Power				
			Channel Position M				
Antenna	NR Modulation	NR Carrier Bandwidth	PAR (dB)	Average Power		Total Power Ports A + B + C+ D	
				dBm	dBm/MHz	dBm	
А	QPSK	5.0 MHz 15 kHz SCS	7.45	45.74	39.84	51.76	
A	QPSK	10.0 MHz 15 kHz SCS	7.57	45.69	36.99	51.71	

#### <u>Remarks</u>

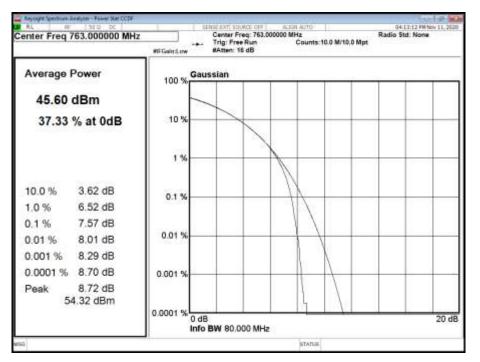
Calculations: Total power = measured output power (port A, worst case) +  $10\log(4)$  and PSD = measured output power -  $(10*\log(OBW/1MHz))$ .



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









## **Configuration A1**

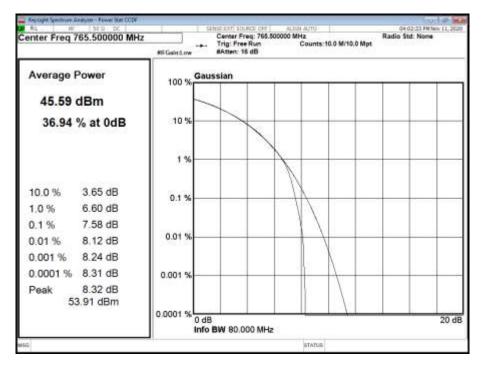
Maximum Output Power 46 dBm

			Peak to Average Ratio (PAR) / Output Power				
		NR Carrier Bandwidth	Channel Position T				
Antenna	NR Modulation		PAR (dB)	Avera	Total Power Ports A + B + C+ D		
				dBm	dBm/MHz	dBm	
А	QPSK	5.0 MHz 15 kHz SCS	7.58	45.77	39.83	51.79	

## <u>Remarks</u>

Calculations: Total power = measured output power (port A, worst case) +  $10\log(4)$  and PSD = measured output power -  $(10*\log(OBW/1MHz))$ .

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



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

The radio unit was tested with maximum output power and without an antenna. ERP/EIRP compliance is addressed at the time of licensing, as required by the responsible FCC/ISED Bureau(s). Licensees are required to take into account maximum allowed antenna gain used in combination with the above power settings to prevent the radiated output power exceeding the limits.



#### 2.2 OCCUPIED BANDWIDTH

## 2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049

#### 2.2.2 Date of Test and Modification State

11 November 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 Temperature23.4°CRelative Humidity53.2%

### 2.2.5 Test Method

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

#### 2.2.6 Test Results

**Configuration A1** 

Maximum Output Power 46 dBm

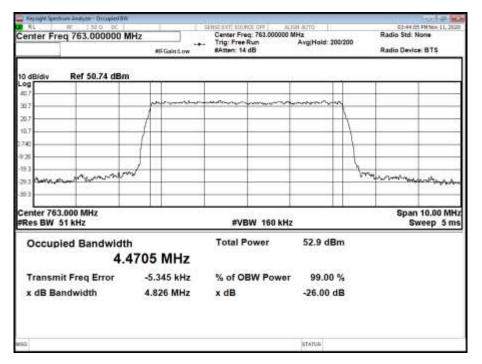
			Result (KHz)						
Antenna NR			Channel Position B		Channel Position M		Channel Position T		
	Modulation Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth	Occupied Bandwidth	-26 dB Bandwidth		
А	QPSK	5.0 MHz 15 kHz SCS	4,472.75	4,837.22	4,470.53	4,826.49	4,467.06	4,838.84	
А	QPSK	10.0 MHz 15 kHz SCS	-	-	9,286.76	9,769.63	-	-	



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

Reptant Spectrum Analyzer - Docupied RA RL RF 53.0 pC	anne	L	\$21652.2007.100		IRI 40710				I PM Nov 11, 200
Center Freq 760.500000 M	ИНz	#FGaint.ow	Center Fri Trig: Free 8Atten: 16		MHz AvgiHold: 2	00/200		adio Std: M adio Devic	
10 dB/div Ref 50.76 dBm	ē								
40.6	-			-					
30.8	-	man	m		man	-	_		
20.8	-1	-				-A-			-
10.8	-1-	-	-			1	-		-
3 760	-11		-	-		++	-		-
4.24		-				1			
192 392 pleasand Marson	2						L'manna	Imm	man
29.2 Villey, and a different of the									
Center 760.500 MHz #Res BW 51 kHz			#VI	BW 160 kHz			24		10.00 MH: veep 5 ms
Occupied Bandwidt	h		Total P	ower	53.1 dE	3m			
4.4	4728	3 MHz							
Transmit Freq Error	-5	.002 kHz	% of O	BW Power	99.00	%			
x dB Bandwidth	4.	837 MHz	x dB		-26.00	dB			
MER					STATUS				







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

Center Freq 765.500000 N	augus -		ext source ore enter Freg: 765		AUTO		G4:02:4 Radio Std:	7 PM Nov 11, 2000
center Fred 705.500000 ii	IITZ IIFGai	1	rig: Free Run Atten: 16 dB		AvgiHold: 2	00/200	Radio Devis	ce: BTS
10 dB/div Ref 50.87 dBm	8				-11	-	AR.	
Log an P		Ĭ	1				Ĭ.	
30.9	m	monor	mon m	any a	maria	-	_	-
20.9						N		-
10.9				-		1	-	-
670				-		1		-
9.13	1			-		1	-	-
131 plan han month	1		-	-		the		-
No. and the				-			Man Mary	mathere
39.1								
Center 765.500 MHz #Res BW 51 kHz	2000	Vii.	#VBW 1	60 kHz		20		10.00 MH weep 5 ms
Occupied Bandwidth	n	1	otal Powe	r	52.8 dB	52.8 dBm		
4.4	4671 M	Hz						
Transmit Freq Error	-9.075	kHz 9	of OBW F	ower	99.00	%		
x dB Bandwidth	4.839 1	/Hz x	dB		-26.00 (	iB		
an .					STATUS			

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

Center Fr	req 763.000000 1	WHz			Trig: Free	q: 763.000000 Run	MHz Avg(Hold: )	200/2	00	Radio Std:	
	-		MFGaint1.	w	BAtten: 16	dB	2012/01/12	0.00	<u></u>	Radio Devi	or BTS
10 dB/div	Ref 51.36 dBn	8									
Log	Rei 51.50 dBil	<u> </u>	1	- 11		<u> </u>					1
31.4			+ your some	nn	amonto	mon	man	m			
21.4		1	and a factor of				all south the second				
11.4		- 1							1		
1 36		- [							1		
-8.64	_	-11	_						-		
19.6	Section and the		-	_					1		-
20.6 2000	monim	965	_					-	Time	protocytest	Philosophies
-38.6				-							
Center 76					122						20.00 MHz
#Res BW	100 KHZ				#VE	300 kH	z			Swee	p 1.933 ms
Occup	pied Bandwidt	h			Total P	ower	53.5 d	Bm			
	9.	286	8 MH	z							
Transn	Transmit Freq Error -14.140 kHz			łz	% of OBW Power 99.00 %						
x dB B	andwidth	9	.770 MH	łz	x dB		-26.00	dB			
ASIC							STATUS				



## 2.3 BAND EDGE

#### 2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 90, Clause 90.543

#### 2.3.2 Date of Test and Modification State

11 November 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 Temperature23.4°CRelative Humidity53.2%

#### 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 four port, the limit was calculated as being -13 dBm - 10 \* Log (4) = -19 dBm.

#### 2.3.6 Test Results

**Configuration A1** 

Maximum Output Power 46 dBm

Antonno	NR Modulation	ND Corrier Dendwidth	Band Edge (MHz)			
Antenna		NR Carrier Bandwidth	Channel Position B	Channel Position T		
А	QPSK	5.0 MHz 15 kHz SCS	760.5	765.5		
A	QPSK	10.0 MHz 15 kHz SCS	763.0	763.0		



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

TYPE WWWWW DET & N.N.N.				Trig: Free I #Atten: 10	Saint ow			
Mkr1 757.975 MH Power -28.48 dB							Ref Offset 49.4 d Ref 43.40 dB	0 dB/div
								°°
				_		-		33.4
				_		-	_	23.4
Nannanana	deveryments	MANY						13,4
							_	3.40
		<i>.</i>	Mal					6.90
001-0024			N <sup>N</sup>					8.6
			N			-		25.6
			1	4				36.6
				body states	Number	mmun	Augus Mary	ES MANY
Span 2.000 MH			0				.000 MHz	

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

Center Freq 769.000000 N	PND: Wide -+-	Trig: Free Run #Amen: 14 dB	Avg Type: RMS	TRACE 1.2.3.4.5.1 TYPE DET A N.N.N.N.
Ref Offset 49.4 dB 0 dB/div Ref 47.40 dBm			0. 5	Mkr1 769.050 MHz -38.85 dBm
37.4				
27.4				
17.4				
7.40				
2.90				
12.6		1		DL1-19.02 dbs
226		1000		
26		<u>\$</u> '	-	
42.6				
Center 769.000 MHz #Res BW 100 kHz	#VBI	W 300 kHz*	#\$	Span 2.000 MHz weep 5.000 s (1001 pts)



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

Center Freq 758.00000	D MHz PND: We IPGalactic			Avg Type: RM	S	TRAC TYP DE	5.23451 ANNNN
Ref Offset 49.4 di 10 dB/div Ref 45.40 dBn	3	2 		ā. Sa	Mi Band Po	ver -31.	50 MHz 71 dBm
35.4							
26.4			-				
15.4			-	m	mm	mm	houring
5.40			-				-
490				/		-	-
1435			1		-	-	0.1 M0249
24.6			1				
315 115 mm	mound	mun	ev.				]
Center 758,000 MHz						Span 2	000 MHz
Res BW 10 kHz		#VBW 30 kHz	<u>e</u>	STATUS	#Sweep	5.000 s (	

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

Center Freq 769.000000 Mi	PACK With	ig: Free Run Itten: 12 dB	Avg Type: RMS	TRACE 1 2 3 4 5 1 TYPE WWWWWW DET A N N N N N
Ref Offset 49.4 dB 0 dB/div Ref 45.40 dBm			0. %	Mkr1 769.044 MHz -41.21 dBm
84				
25.4				
15.4				
5.40				
400				
14.6				0,1 M02464
24.6				
		•1		
446				
Center 769.000 MHz Res BW 100 kHz	#VBW 30	00 kHz*	#\$	Span 2.000 MHz weep 5.000 s (1001 pts)



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

|--|



### 2.4 TRANSMITTER SPURIOUS EMISSIONS

#### 2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 90, Clause 90.543

#### 2.4.2 Date of Test and Modification State

11 November 2020 - 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 Temperature23.4°CRelative Humidity53.2%

#### 2.4.5 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 four port, the limit was calculated as being -13 dBm - 10 \* Log (4) = -19 dBm.

#### 2.4.6 Test Results

Configuration A1

Maximum Output Power 46 dBm



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 1 - Range 0.009 to 1200 MHz

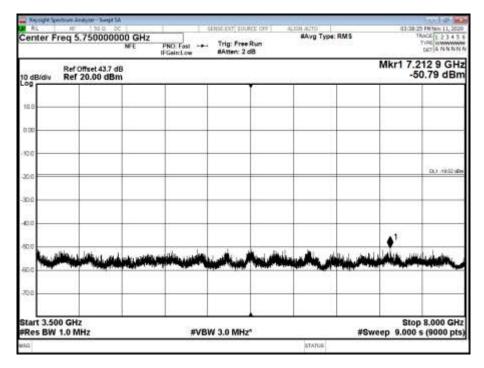
AL.	ch Atten 12	dB NFE	NO Fast +	Trig: Free AAtten: 12	Run	SRI A	ono   vyg Type:	RMS	1	ANNOV 11, 2000 RACE 1, 2, 3, 4, 5 DET A N.N.N.N.
10 dB/div	Ref Offset 49.7 Ref 49.70 dB	dB							Mkr1 7 31	59.8 MH: 9.96 dBn
397						4	y'			
297						-	-			
19.7		-				-	-			-
9.70		-				-	-			-
0.10		-				-				
10.3		-				-	-			
20.3										DL1-10.0248
30.3						1				
433		وداد بالمار والمراجد		فالإستياد	واجتلا المدليا	-	Hanas		nytesta ta cana	-
Start 9 kH #Res BW	4z		#VB	W 3.0 MHz	•3			#Swe		1.2000 GHz s (2400 pts
ASIQ			1101000			8	TATUS	1702302		

# Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 2 - Range 1200 to 3500 MHz

Center F	req 2.35000		PNO Fast	Frig: Free Run Atten: 10 dB	#Avg Type: RMS		TRACE 5 2 3 4 5 6 TYPE WWWWWW DET A N.N.N.N.N
0 dB/div	Ref Offset 42 Ref 20.00 d				(i). (c).	Mkr1 3.	231 9 GHz 49.06 dBm
10.0							
0.00							
10.0							
20.0					_		Dct -12.02 dBit
30.0							-
40.0		_				-	-
10.0		78 1-550 -554		and a little	h Allana francische and	the Lation Elstern states	
80.0			Municipal Andrews		e desta se de la contraction de la contra Contraction de la contraction de la cont		
70.0							
Start 1.20 Res BW	1.0 MHz		#VBW :	3.0 MHz*		Sto #Sweep 4.600	p 3.500 GHz s (4600 pts)
usia.			110000000	1000101011	STATUS		



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position B - Band 3 - Range 3500 to 8000 MHz



# Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position M - Band 1 - Range 0.009 to 1200 MHz

Input N	Mech At	tten 14 di	8 NFE	NO Fast -+	Trig: Free AAtten: 14	Run	801 A 80	wg Type:	RMS		7 PM Nov 11, 2000 RACE 1 2 3 4 5 TYPE WWWWWW DET A N N N N
10 dB/dir		Offset 49.7 d 49.70 dBn	3	-Galici de	Bearing of					Mkr1 7 31	61.8 MH
.og 								1			
29.7											
19.7											
9.7D											
2,30								-			
10.3							-	-			
20.3											DL1-19.02-db
30.3											
413			-		-		**	haird	(Dangeleingeleader)		
Start 9 Res B	kHz W 1.0 M	IHz		#VB	W 3.0 MHz	•3			#Swe		1.2000 GHz s (2400 pts
WRES B	W 1.0 M	INZ		#VB	W 3.0 MHZ	7.0	1	TATUE	#SW0	ep 2.400	s (2400 pts



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position M - Band 2 - Range 1200 to 3500 MHz

	90-0 OC	I shear	isona ont	ALISH AUTO BAvg Type: F		01:56	17 PM Nov 11, 200 Ruce 1, 2 3 4 5
Center Freq 2.35	NFE	PNO: Fast Trig: P IFGainLow #Amen	ree Run 10 dB	week the state			TYPE WWWWWW
	et 42.4 dB .00 dBm			0. 57		Mkr1 2.9	21 4 GH
.00							
10.0			-	-			-
0.00							-
10.0			_				-
20.0							DL1-1902-00
30.0			_	_			
40.0							
80.0							
200 Hickney His Alling	منتحا الانتجابية والمقص	haday garante and a state			ووراليذجهية	ly intersection of	-
000							
70.0							
Start 1.200 GHz #Res BW 1.0 MHz	2	#VBW 3.0 M	H7*		#\$340		5 3.500 GHz
ASG	57. 	#VDVF 5.0 M	116	STATUS	1011	op 4.000	e faces his

# Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position M - Band 3 - Range 3500 to 8000 MHz

Center F	req 5.750000	NFE	PNO: Fast	Trig: Free SAmen: 2	Run	#Ауу Туре:	RMS	TR	PM Nov 11, 2020 ACE 1 2 3 4 5 1 VPS WWWWWWW DET A N N N N
0 dB/div	Ref Offset 43.7 Ref 20.00 dB					1		Mkr1 4.00 -50	68 1 GHz ).65 dBm
10.0		_	_						
0.00									
10.0									
20.0		+							DL1 -19.02 UB
30.0			-						-
40.0	34								
10.0	Alle and a state	a an a difference	مرد بالاس	و ي الأمد أي	Section 1	-	at, the chairs of	اللام . والأل	وأقدده
60.0					ACC NO.				
10.0									
Start 3.50 Res BW			#VB	W 3.0 MHz	*		#Sw	Stop 9.000 s	8.000 GHz
siQ.						STATUS			( p



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 1 - Range 0.009 to 1200 MHz

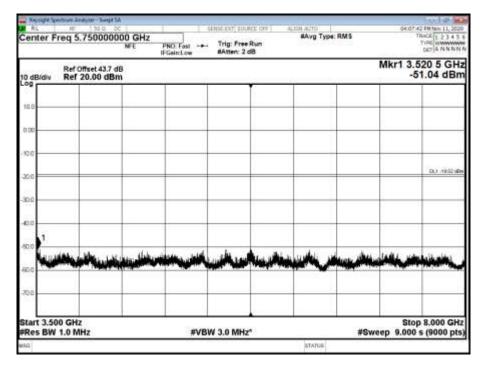
put Mech Atten 14 dB	PNO: Fast Trig: Free IFGainLow dAtten: 14	#Av Run	g Type: RMS	04:04:04 FM Nov 11, 20 TRACE 1, 2, 3, 4 TYPE WWWW DET A NA N
Ref Offset 49.7 dB dB/div Ref 51.70 dBm				Mkr1 764.3 Mi 39.89 dB
17			1	
0	_			
1.7				
1.7				-
70				
30		1		
				0.1.3202
83				
-	بالمهمن والفاجل المجل والمساجل والمعاد والمغار		المراجع ومعادية	والاعادية ورجو بالالهاد والم
tart 9 kHz Res BW 1.0 MHz	#VBW 3.0 MHz	•3	#\$1	Stop 1.2000 Gi weep 2.400 s (2400 p

## Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 2 - Range 1200 to 3500 MHz

Center Freq	2.350000000 GHz	PNO Fast Trig	r soukar ow Free Run en: 10 dB	#Avg Type: RMS		TYPE NWW 11, 2020
	f Offset 42.4 dB ef 20.00 dBm				Mkr1 3.1	126 9 GHz 8.51 dBm
10.0		_				
0.00		_			_	
10.0			_		_	-
20.0					_	DL1-19.02 (ØH
30.0						-
40.0			_		A1	
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70.0		-				
Start 1.200 G		#VBW 3.0	MHz*		Stoj Sweep 4.600	o 3.500 GHz
160				STATUS	and the second	- frees hes



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 5.0 MHz 15 kHz SCS - Channel Position T - Band 3 - Range 3500 to 8000 MHz



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 1 - Range 0.009 to 1200 MHz

Input N	lech A	tten 14 d	B	PNO Fast -+	Trig: Free Atten: 14	Run	8.A	vg Type:	RMS	- 31	DET A N N N N
10 dB/div		Offset 49.7 c 51.70 dBi	18							Mkr1 7 30	60.8 MH: 5.69 dBn
417								a:			
31.2											
21.7											
11.7						-					
1.70								-			
5.30								+			-
13	_							-			0.135.02-05
28.3			-								
38.3											
		inputtors	ungeneratives.		<u>مايم ولي لوتيا وا</u>	teniner/sees	-	in the second	القجم البيغ	ال العام والفارد	
Res B		AHz		#VE	W 3.0 MHz	e S			#Swe	Stop 1 rep 2.400 f	1.2000 GH
#Res B		MHz		#VE	W 3.0 MHz	<b>4</b> 3	1	TATUS	#Swe		



#### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 2 - Range 1200 to 3500 MHz

RL.	req 2.350000	pc	PNO Fast	Trig: Free Ry AAmen: 10 dB		#Avg Type:	RMS	TP	PM Mon 11, 2000 MCE 1, 2, 3, 4, 5, 1 TIPS MANNAN DET A NANNN
10 dB/div	Ref Offset 42.4 Ref 20.00 dB		IFGaintow	BARRY: 10 DE	9		1	Mkr1 3.2	43 9 GH
<sup>-</sup>									
10.0		-	-						
0.00			-						
10.0			-						
20.0									Dc1 -12.02 uB
30.0									
40.0									
80.0								•	1
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70.0									
Start 1.20 #Res BW			#VB	W 3.0 MHz*			#Swe		3.500 GH
ASIC	An Channel State			CONSCRETE ST		STATUS			

### Antenna A - NR Modulation QPSK - NR Carrier Bandwidth 10.0 MHz 15 kHz SCS - Channel Position M - Band 3 - Range 3500 to 8000 MHz

Center F	req 5.75000		PNO: Fast	Trig: Free SAmen: 2	Run	#Avg Type	RMS	78	PM Nov 11, 2500 MCE 1, 2, 3, 4, 5, 1 DRT A N N N/N
10 dB/div	Ref Offset 43.7 Ref 20.00 di							Mkr1 3.5 -51	18 0 GHz 1.13 dBm
10.0		_						-	
0.00									
90.0									
20.0									DL1 -12.02 UB
30.0			-			-	-		
00			-			-		-	
10.0	the mark	in the second	والقارب والمقاطع	د. مراجع ال		ىر يتقلدن	and the	ىلىنى بىغانى	
60.0		Constantion of		APAS. AND					
70.0									
Start 3.50 Res BW	0 GHz 1.0 MHz		#VB	W 3.0 MHz	*		#Sw	Stop eep 9.000 s	8.000 GHz
pa.			10.000			STATUS			

Limit -19dBm



**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
Broadband Transmitting Po					-
Thermo-Hygro-Barometer		PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P MON
Multimeter	Fluke	79	3057	12	21-Aug-2021
Attenuator 10dB 100W	Weinschel	48-10-43	4867	12	23-Jul-2021
Attenuator 40dB 100W	Weinschel	48-40-43-LIM	5134	12	29-Nov-2020
PXA Signal Analyser	Keysight	N9030A	4653	12	10-Feb-2021
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	09-May-2021
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-May-2021
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	79	3057	12	21-Aug-2021
Attenuator 10dB 100W	Weinschel	48-10-43	4867	12	23-Jul-2021
Attenuator 40dB 100W	Weinschel	48-40-43-LIM	5134	12	29-Nov-2020
PXA Signal Analyser	Keysight	N9030A	4653	12	10-Feb-2021
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	09-May-2021
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-May-2021
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	79	3057	12	21-Aug-2021
Attenuator 10dB 100W	Weinschel	48-10-43	4867	12	23-Jul-2021
Attenuator 40dB 100W	Weinschel	48-40-43-LIM	5134	12	29-Nov-2020
PXA Signal Analyser	Keysight	N9030A	4653	12	10-Feb-2021
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	09-May-2021
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-May-2021
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
Transmitter Spurious Emiss	l sions				
Thermo-Hygro-Barometer	PCE Instruments	PCE-THB-40	5480	12	18-Mar-2021
Power Supply	Rohde & Schwarz	HMP4040	4954	-	O/P MON
Multimeter	Fluke	79	3057	12	21-Aug-2021



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Attenuator 10dB 100W	Weinschel	48-10-43	4867	12	23-Jul-2021
Attenuator 40dB 100W	Weinschel	48-40-43-LIM	5134	12	29-Nov-2020
PXA Signal Analyser	Keysight	N9030A	4653	12	10-Feb-2021
Frequency Standard	Spectracom	SecureSync 1200- 0408-0601	4393	6	09-May-2021
Rubidium Standard	Rohde & Schwarz	XSRM	1316	6	09-May-2021
Analyser	Rohde & Schwarz	ZVA 40	3548	12	11-Dec-2020
Calibration Kit	Rohde & Schwarz	ZV-Z54	4368	12	28-Nov-2020
HPF 1GHz	Mini-Circuits	NHP 1000+	5260	12	07-Aug-2021
HPF 3GHz	Advance Power Components	11SH10- 3000/X18000-O/O	4411	12	01-Jul-2021

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 Amplitu	de	± 0.885 dB
Conducted Emissions	30 MHz to 20 GHz Amplitu	de	± 1.568 dB
Oppupied Depolyuidth	Lin to 15 Miliz Dondwidth	5 MHz Bandwidth	± 33321 Hz
Occupied Bandwidth	Up to 15MHz Bandwidth	10 MHz Bandwidth	± 67172 Hz
Band Edge	30 MHz to 20 GHz Amplitu	30 MHz to 20 GHz Amplitude	

#### 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).

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ANNEX A

MODULE LIST



Configuration A1			
Product	Product No	R-State	Serial No
Radio 4478 B14	KRC161 669/3	R1C	D16X143630
Software Version:	CXP9013268/15	Revision:	R84FJ