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Report On

FCC Testing of the

Ericsson Remote Radio Unit LTE KRC 161 711/1, Radio 2208 B48 (3650-3675 MHz) in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 90Z

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA8AKRC161711-1

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30 October 2019

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October 2019

DATED

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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 2208 B48
Serial Number(s)	D827120517
Software Version	CXP9034711/2 Revision R1K
Hardware Version	R1B
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2018 FCC CFR 47 Part 90: 2018
Start of Test	09 October 2019
Finish of Test	14 October 2019
Name of Engineer(s)	Neil Rousell
Related Document(s)	KDB 971168 D01 v03r01 KDB 662911 D01 v02r01 ANSI C63.26-2015 ANSI/TIA-603-E-2016

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 90. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

im

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 90Z is shown below.

Conting	Specification Clause		Test Description	Decult
Section	FCC CFR 47 Part 2	FCC CFR 47 Part 90	Test Description	Result
2.1	2.1046	90.1321 (a)	Output Power and Peak to Average Ratio	Pass
2.2	2.1049(h)	90.1323	Occupied Bandwidth	Pass
2.3	2.1051	90.1323	Band Edge	Pass
2.4	2.1051	90.1323	Transmitter Spurious Emissions	Pass
2.5	2.1055	90.213	Frequency Stability	Pass
2.6	2.1053	90.1323	Radiated Emissions	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

Configurati	on			Configuration A	Configuration B
Single carri	ier				
Bandwidth (MHz)	Bottom (MHz)	Middle (MHz)	Top (MHz)	Output power per port with Antenna 4x4 MIMO (dBm)	Output power per port without Antenna (dBm)
20	3660	3662.5	3665	23	36
2 Carriers -	all cases	except Band Edg	ge		
Bandwidth (MHz)	Bottom (MHz)	Middle (MHz)	Top (MHz)	Output power per port with Antenna 4x4 MIMO (dBm)	Output power per port without Antenna (dBm)
20+5	-	3660 + 3672.5	-	23 + 17	36 + 30
2 Carriers -	Band edg	je			
Bandwidth (MHz)	Bottom (MHz)	Middle (MHz)	Top (MHz)	Output power per port with Antenna 4x4 MIMO (dBm)	Output power per port without Antenna (dBm)
20+5	-	3660 + 3672.5	-	23 + 17	36 + 30
5+20	-	3652.5 + 3665	-	17 + 23	30 + 36

Testing on single carrier 5 MHz bandwidth, was conducted with the EUT operating in a 2-carrier configuration, 20 MHz + 5 MHz bandwidths. The single carrier 5 MHz configuration measurements were performed on the 5 MHz carrier only.

The 20 MHz bandwidth, single carrier was tested on B, M and T channels. The 20 MHz + 5 MHz or 5 MHz + 20 MHz configurations, could not be tested in B, M, T configurations, (3650 - 3675 MHz = 25 MHz bandwidth). Therefore, this configuration was detailed as M.



1.4 DECLARATION OF BUILD STATUS

MANUFACTURING DESCRIPTION	Remote Radio Unit
MANUFACTURER	Ericsson AB
PRODUCT NAME	Radio 2208 B48
PRODUCT NUMBER	KRC 161 711/1
TRANSMITTER OPERATING RANGE	TX/RX: 3650 - 3675 MHz
MODULATIONS	LTE: QPSK, 16QAM, 64QAM, 256QAM
ITU DESIGNATION OF EMISSION	LTE: 5M00F9W, 20M0F9W
NUMBER OF CARRIERS	Maximum 2 carriers
SUPPORTED CHANNEL BANDWIDTH CONFIGURATION	LTE: 5MHz, 20MHz
MAX OUTPUT POWER (RMS) (W or dBm)	40.0dBm (5W) per port 36.0dBm (4W) for 20MHz and 30.0dBm (1W) for 5MHz per port
OUTPUT POWER TOLERANCE	+0.6/-2.0 dB
INSTANTANEOUS BANDWIDTH	60MHz
NUMBER OF ANTENNA PORTS	2 TX/RX ports
MIMO supported	2x2 and 4x4
Integrated Antenna name	Antenna 6550
Integrated Antenna product number	KRE 101 2251/2
Integrated Antenna Gain	11.5 ± 0.5dBi
FCC ID	TA8AKRC161711-1
Power source	36V DC
TECHNICAL DESCRIPTION	The equipment is the Remote Radio Part of TDD TE Rese
(a brief description of the intended use and operation)	Station.

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



1.5 **PRODUCT INFORMATION**

1.5.1 Technical Description

The Equipment Under Test (EUT) KRC 161 711/1 is an Ericsson AB Radio Unit working in the public mobile service 3650-3675 MHz band which provides communication connections to 3650-3675 MHz network. The KRC 161 711/1 operates from a -48V DC or a 120V AC power 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 in a shielded enclosure, test laboratories or a chamber as appropriate.

The EUT was powered from a 120V, 60Hz AC supply.

FCC Measurement Facility Registration Number 90987 Octagon House, Fareham Test Laboratory

1.8 DEVIATION FROM THE STANDARD

FCC Part 90.1321(a) states that "Base and fixed stations are limited to 25 watts/25 MHz equivalent isotopically radiated power (EIRP). In any event, the peak EIRP power density shall not exceed 1 Watt in any 1 MHz slice of spectrum." Testing detailed in this report was performed using an average (RMS) detector, as there is a frequency overlap with FCC Part 90.41(e)(3)(iii), which allows for either peak or average measurements.

No other 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

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



SECTION 2

TEST DETAILS



2.1 AVERAGE OUTPUT POWER AND PEAK TO AVERAGE RATIO

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046 FCC CFR 47 Part 90, Clause 90.1321(a)

2.1.2 Date of Test and Modification State

14 October 2019 - 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 Temperature22.1°CRelative Humidity51.3%

2.1.5 Test Method

Measurements were performed with a Spectrum Analyser using the Band Power measurement function. The detector was set to RMS with an RBW of at least 1 % of the carrier bandwidth and a VBW of at least 3 times the RBW. The integration bandwidth was configured to be 25 MHz as defined in 90.1321(a). Measurements were performed in accordance with ANSI C63.26 Clause 5.2.4.4.1.

For PSD measurements in a 1 MHz bandwidth, measurements were made in accordance with ANSI C63.26 Clause 5.7.2(a). A resolution bandwidth of at least 1 % of the emission bandwidth was chosen in conjunction with an Integration Bandwidth of 1 MHz. An RMS detector was used with a single slow sweep utilised. The highest PSD was established over the entire emission bandwidth and the result recorded.

The measured results were summed in accordance with FCC KDB 662911 to account for 2 port MIMO operation.

CCDF measurements were carried out in accordance with ANSI C63.26 Clause 5.2.3.4.

2.1.6 Test Results

Configuration A

Maximum Output Power 20 MHz, 23 dBm and 5 MHz, 17.00 dBm



				Peak to Average Ratio (PAR) / Output Power / EIRP								
	1.75	LTE Carrier		Channel Position B								
Antenna	Modulation	Bandwidth				Av	erage Pov	ver				
Modulation	woodlation	(MHz)	(dB)	dBm	dBm /	EIRP	/MHz	dBm /	EIRP/2	25MHz		
			(ub)	UDITI	MHz	dBm	W	25MHz	dBm	W		
A	64QAM	5.0	*	16.95	10.38	22.38	0.17	-	-	-		
MIMO 2 >	(2 (+3dB)		-	-	-	25.38	0.35	-	-	-		
MIMO 4 >	(4 (+6dB)		-	-	-	28.38	0.69	-	-	-		
A	64QAM	20.0	8.42	22.87	10.47	22.47	0.18	22.91	34.91	3.10		
MIMO 2 >	(2 (+3dB)		25.47 0.35 - 37.91 6.18						6.18			
MIMO 4 >	(4 (+6dB)		-	-	-	28.47	0.70	-	40.91	12.33		

Remarks

* Not possible to measure the PAR of the 5 MHz carrier in a 2 carrier configuration. Antenna gain 12 dBi.







Maximum Output Power 23.00 dBm

		LTE LTE Carrier Bandwidth (MHz)	Peak to Average Ratio (PAR) / Output Power / EIRP										
	1.75			Channel Position M									
Antenna	Modulation					Av	erage Pov	ver					
				dDm	dBm/M	EIRP/MHz		dBm /	EIRP/2	25MHz			
			(uD)	UDITI	Hz	dBm	W	25MHz	dBm	W			
А	64QAM	20.0	8.42	22.83	10.40	22.40	0.17	22.85	34.85	3.05			
MIMO 2 >	(2 (+3dB)		-	-	-	25.40	0.35	-	37.85	6.10			
MIMO 4 >	(4 (+6dB)		-	-	-	28.40	0.69	-	40.85	12.16			

Remarks

Antenna gain 12 dBi.

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M





Maximum Output Power 20 MHz, 23 dBm and 5 MHz, 17.00 dBm

				Peak to Average Ratio (PAR) / Output Power / EIRP								
	1.75	LTE Carrier		Channel Position T								
Antenna	Modulation	Bandwidth				Av	erage Pov	ver				
Woddiatio	wouldtion	' (MHz)		dPm	dBm /	EIRP	/MHz	dBm /	EIRP/2	25MHz		
			(ub)	UDIII	MHz	dBm	W	25MHz	dBm	W		
Α	64QAM	5.0	*	17.28	10.68	22.68	0.19	-	-	-		
MIMO 2 >	(2 (+3dB)		-	-	-	25.68	0.37	-	-	-		
MIMO 4 >	(4 (+6dB)		-	-	-	28.68	0.74	-	-	-		
Α	64QAM	20.0	8.41	22.84	10.37	22.37	0.17	22.83	34.83	3.04		
MIMO 2 >	(2 (+3dB)		25.37 0.34 - 37.83 6.07						6.07			
MIMO 4 >	(4 (+6dB)		-	-	-	28.37	0.69	-	40.83	12.11		

Remarks

* Not possible to measure the PAR of the 5 MHz carrier in a 2 carrier configuration. Antenna gain 12 dBi.

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T





Maximum Output Power 20 MHz, 23.00 dBm + 5 MHz, 17.00 dBm

			Peak to Average Ratio (PAR) / Output Power / EIRP									
	1.75	LTE Carrier		Channel Position M								
Antenna	LIE	Bandwidth		Average Power								
Wodula	wouldtion	(MHz)		dDm	dBm /	EIRP	/MHz	dBm /	EIRP/2	25MHz		
			(UD)	UDIII	MHz	dBm	W	25MHz	dBm	W		
A	64QAM	5.0 + 20.0	-	23.79	10.43	22.43	0.17	23.81	35.81	3.81		
MIMO 2 >	< 2 (+3dB)		-	-	-	25.43	0.35	-	38.81	7.60		
MIMO 4 >	< 4 (+6dB)		-	-	-	28.43	0.70	-	41.81	15.17		
Α	64QAM	20.0 + 5.0	-	23.78	10.61	22.61	0.18	23.80	35.80	3.80		
MIMO 2 >	< 2 (+3dB)		-	-	-	25.61	0.36	-	38.80	7.59		
MIMO 4 >	(4 (+6dB)		-	-	-	28.61	0.73	-	41.80	15.14		

<u>Remarks</u>

Antenna gain 12 dBi.



Maximum Output Power 20 MHz, 36.00 dBm, 5 MHz, 30.00 dBm

				P	eak to Ave	rage Ratio	(PAR) / C	utput Pow	er		
	1.75	LTE LTE Carrier Bandwidth (MHz)		Channel Position B							
Antenna	LIE					Av	erage Pov	ver			
Woddiati	wouldtion			dDm	dBm /	/M	Hz	dBm /	/25	ЛНz	
			(ub)	UDIII	MHz	dBm	W	25MHz	dBm	W	
Α	64QAM	5.0	*	29.96	23.38	23.38	0.22	-	-	-	
MIMO 2 >	(2 (+3dB)		-	-	-	26.38	0.43	-	-	-	
MIMO 4 >	(4 (+6dB)		-	-	-	29.38	0.87	-	-	-	
Α	64QAM	20.0	7.13	36.09	23.65	23.65	0.23	36.08	36.08	4.06	
MIMO 2 >	(2 (+3dB)		-	-	-	26.65	0.46	-	39.08	8.09	
MIMO 4 >	(4 (+6dB)		-	-	-	29.65	0.92	-	42.08	16.14	

Remarks

* Not possible to measure the PAR of the 5 MHz carrier in a 2 carrier configuration.

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B





Maximum Output Power 36.00 dBm

		LTE Carrier	Peak to Average Ratio (PAR) / Output Power									
	1.75			Channel Position M								
Antenna M	Modulation	Bandwidth				Av	erage Pow	/er				
		(MHz)	PAR (dB)	(dB) dBm	dBm /	/M	Hz	dBm /	/251	ЛНz		
					MHz	dBm	W	25MHz	dBm	W		
А	64QAM	20.0	7.15	35.96	23.55	23.55	0.23	35.95	35.95	3.94		
MIMO 2 x	: 2 (+3dB)		-	-	-	26.55	0.45	-	38.95	7.85		
MIMO 4 x	4 (+6dB)		-	29.55 0.90 - 41.95 15.6								

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M





Maximum Output Power 20 MHz, 36.00 dBm, 5 MHz, 30.00 dBm

				Peak to Average Ratio (PAR) / Output Power								
	1.75	LTE LTE Carrier Bandwidth (MHz)		Channel Position T								
Antenna	LIE					Av	verage Pov	ver				
Woddiatio	wouldtion			dDm	dBm /	/M	Hz	dBm /	/25	ИНz		
			(ub)	UDIII	MHz	dBm	W	25MHz	dBm	W		
A	64QAM	5.0	*	30.29	23.73	23.73	0.24	-	-	-		
MIMO 2 ×	(2 (+3dB)		-	-	-	26.73	0.47	-	-	-		
MIMO 4 x	(4 (+6dB)		-	-	-	29.73	0.94	-	-	-		
Α	64QAM	20.0	7.15	36.00	23.65	23.65	0.23	35.97	35.97	3.95		
MIMO 2 x	(2 (+3dB)		-	-	-	26.65	0.46	-	38.97	7.89		
MIMO 4 x	(4 (+6dB)		-	-	-	29.65	0.92	-	41.97	15.74		

Remarks

* Not possible to measure the PAR of the 5 MHz carrier in a 2 carrier configuration.

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T





Maximum Output Power 20 MHz, 36.00 dBm + 5 MHz, 30.00 dBm

		LTE Carrier Bandwidth (MHz)		Pe	eak to Ave	rage Ratio	(PAR) / C	utput Pow	er				
	1.75			Channel Position M									
Antenna	LIE			Average Power									
	wouldtion			dDm	dBm /	/M	Hz	dBm /	/25	ИНz			
			(dB) dBm		MHz	dBm	W	25MHz	dBm	W			
A	64QAM	5.0 + 20.0	-	37.03	23.72	23.72	0.24	37.03	37.03	5.05			
MIMO 2 >	< 2 (+3dB)		-	-	-	26.72	0.47	-	40.03	10.07			
MIMO 4 >	< 4 (+6dB)		-	-	-	29.72	0.94	-	43.03	20.09			
Α	64QAM	20.0 + 5.0	-	36.92	23.81	23.81	0.24	36.90	36.90	4.90			
MIMO 2 >	< 2 (+3dB)		-	-	-	26.81	0.48	-	39.90	9.77			
MIMO 4 >	(4 (+6dB)		-	-	-	29.81	0.96	-	42.90	19.50			

Limit	
EIRP	≤25 W / 25 MHz, Peak EIRP ≤ 1 W / MHz



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049(h) FCC CFR 47 Part 90, Clause 90.1323

2.2.2 Date of Test and Modification State

08 October 2019 - 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 Temperature23.3°CRelative Humidity48.6%

2.2.5 Test Method

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

2.2.6 Test Results

Configuration B

Maximum Output Power 20MHz 36.00 dBm, 5 MHz 36.00 dBm + 30.00 dBm

Antenna	LTE Modulation	LTE Carrier Bandwidth (MHz)	Result (MHz)								
			Channel I	Channel Position B		Channel Position M		Position T			
			Occupied	-26 dB	Occupied	-26 dB	Occupied	-26 dB			
			Bandwidth	Bandwidth	Bandwidth	Bandwidth	Bandwidth	Bandwidth			
А	64QAM	5.0	-	-	4.48	4.83	-	-			
A	64QAM	20.0	17.85122	18.97931	17.87371	19.05650	17.92406	18.90256			



Keysight Spect	trum Analyzer - Occupied B	W			
enter Fr	RF 50 Ω DC	0 GHz	SENSE:EXT SOURCE OF Center Frea: 3.6	F ALIGN AUTO	11:15:07 AM Oct 10, 2019 Radio Std: None
]	#IFGain:Low	⊷ Trig: Free Run #Atten: 10 dB	Avg Hold: 200/200	Radio Device: BTS
10 dB/div	Ref 36.49 dB	m			
26.5					
16.5	romon	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mmmmm	mbrandoman	mmm
6.49					\\
-3.51	/				
-13.5	M .				
-23.5					
-33.5					
-43.5					
-53.5					
Center 3.6	72500 GHz		#\/B\//	160 kHz	Span 6.000 MHz Sweep 3 ms
WICS DW	51 KHZ		#*80**		0weep 3 m3
Occup	ied Bandwid	th	Total Powe	er 37.7 dBm	
	4.	.4834 MHz			
Transm	it Freq Error	-22.884 kHz	% of OBW	Power 99.00 %	
x dB Ba	ndwidth	4.825 MHz	x dB	-26.00 dB	
WSG				STATUS	

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 5.0 MHz - Channel Position M

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B

🔤 Keysight Spectrum Analyzer - Occupied BW										
er Freg 3.66000000	0 GHz	SENSE:INT SOURCE OFF ALI Center Freq: 3.660000000	GN AUTO GHz	12:05:47 PM Oct 08, 2019 Radio Std: None						
	#IFGain:Low	→ Trig: Free Run #Atten: 10 dB	Avg Hold: 200/200	Radio Device: BTS						
div Ref 42.48 dB	m									
	- man m. cha . Co-	an momentance and adams	1							
			Sector of the se							
	D.									
In many mound	Arrold I		- Way	many many many						
er 3.66000 GHz				Span 40.00 MHz						
BW 200 kHz		#VBW 620 kHz		Sweep 1 ms						
cupied Bandwid	lth	Total Power	44.1 dBm							
1	7.851 MHz									
ansmit Freq Error	-31.680 kHz	% of OBW Power	99.00 %							
IB Bandwidth	18.98 MHz	x dB	-26.00 dB							
			STATUS							
	htt Spectrum Analyzer - Occupied الله الله الله الله الله الله الله الله	pht Spectrum Analyzer - Occupied BW PF Freq 3.660000000 GHZ div Ref 42.48 dBm div Ref 42.48 dBm d	pht Spectrum Aasyzer - Occupied BW SENSE:INT SOURCE OFF ALL r Freq 3.660000000 GHz Center Freq: 3.66000000 Trig: Free Run ////////////////////////////////////	get Spectrum Analyzer - Occupied BW SENSE:INT SOURCE OFF_ALIGN AUTO get Freq 3.660000000 GHz Center Freq: 3.660000000 GHz miFGain:Low Trig: Free Run div Ref 42.48 dBm rotal Power Ref 42.41 dBm </td						



Keysight Spectrum Analyzer - Occupied BV	V			
RL RF 50 Ω DC		SENSE:INT SOURCE OFF A	LIGN AUTO	01:05:29 PM Oct 08, 2019 Radio Std: None
	#FGain:Low	→ Trig: Free Run #Atten: 10 dB	Avg Hold: 200/200	Radio Device: BTS
0 dB/div Ref 42.66 dBr	n		,	
32.7				
22.7	- Marine	Man and all marked and a second	muner later have have	
2.66				
7.34				
77.3				
37.3	^lnx^luf		- m	Internet warder when the second
47.3				
Center 3.66250 GHz Res BW 200 kHz		#VBW 620 kH	İz	Span 40.00 MH Sweep 1 m
Occupied Bandwidt	h	Total Power	43.5 dBm	
17	7.874 MHz			
Transmit Freq Error	-48.579 kHz	% of OBW Powe	r 99.00 %	
x dB Bandwidth	19.06 MHz	x dB	-26.00 dB	
SG			STATUS	

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T

Keysight Spect	trum Analyzer - Occupied BW	1			- 6 -
XIRL .	RF 50 Ω DC		SENSE:INT SOURCE OFF AL	IGN AUTO	01:18:20 PM Oct 08, 2019
Center Fre	eq 3.665000000	GHZ H	Trig: Free Run	Avg Hold: 200/200	Radio Std. None
		#IFGain:Low	#Atten: 10 dB		Radio Device: BTS
10 dB/div	Ref 42.18 dBn	า ุ			
Log					
32.2		Man 25-0 4 - 040	anno - dal Mano a a chi a	a uslaa waana	
22.2		1	Construct of the Charles of the Char	Counce way is not	
12.2					
2.18				{	
-7.82					
-17.8					
-27.8	0 0.0				
37.8	www.	white a		90 <u>1</u> 0	and many and a second the second of the for
.57.0					
-47.0					
Center 3.6	6500 GHz				Span 40.00 MHz
#Res BW 🗄	200 kHz		#VBW 620 kH	z	Sweep 1 ms
0	ia d. Danaluul dé	La.	Total Power	42.5 dBm	
Occup	led Bandwidt	n	Total Fower	43.5 UBIII	
	17	′.924 MHz			
Transm	it Freg Error	-33.852 kHz	% of OBW Power	99.00 %	
		40.00 MU-		26.00	
хавва	inawiath	18.90 MHZ	хав	-20.00 dB	
MSG				STATUS	



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 90, Clause 90.1323

2.3.2 Date of Test and Modification State

10 October 2019 - 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 Temperature21.7°CRelative Humidity40%

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.

The limit was calculated as being -13 dBm - 10 * Log (4) = -19 dBm.

2.3.6 Test Results

Configuration B

Maximum Output Power 36.00 dBm

Antenna	LTE Modulation	LTE Carrier	Band Edge (MHz)			
		Bandwidth (MHz)	Channel Position B	Channel Position T		
A	64QAM	5.0	3,652.5	3,672.5		
А	64QAM	20.0	3,660.0	3,665.0		



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 5.0 MHz + 20 MHz - Channel Position B





Keysight Spe	ectrum Analyzer - Swept S	5A							
RL	RF 50 Ω [SENSE:EXT SOUR	CE OFF A	LIGN AUTO	DMC	11:30:25	AM Oct 10, 2019
Center F	Gate: LO	JUU GHZ	PNO: Fast ++	. Trig: Exter #Atten: 12	nal1 dB	Avg type.	RIVIS	1	DET A NNNN
10 dB/div	Ref Offset 42.8 d Ref 38.80 dB	dB m					N	1kr1 3.70 -43	0 04 GHz 3.97 dBm
					,				
28.8									
18.8									
8.80									
1.20									
-11.2									
21 2									DL1 -19.02 dBm
24.2									
31.2	l.				.1				
41.2	III hope provide general	**********	and and a second second	allow-outloor year	a company	www.www.www	nation of special states of the		u,Bayer,Bharberta
-51.2									
Center 3.3	70000 GHz							Span	60.00 MHz
#Kes BW	91 KHZ		#VB	5WV 160 KHZ*	•	STATUS	#Swe	ep 5.000 s	(1001 pts)



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B









2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 90, Clause 90.1323

2.4.2 Date of Test and Modification State

08 October 2019 - 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 Temperature23.3°CRelative Humidity48.6%

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.

The limit was calculated as being -13 dBm - 10 * Log (4) = -19 dBm.

2.4.6 Test Results

Configuration B

Maximum Output Power 20 MHz, 36.00 dBm and 5 MHz, 30 dBm



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20 MHz + 5.0 MHz - Channel Position M -Range 0.009 to 5000 MHz



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20 MHz + 5.0 MHz - Channel Position M - Range 5000 to 18000 MHz

Keysight	t Spectrum Ana	alyzer - Swept SA								
RL	RF	50 Ω DC			SENSE:EXT SOUR	RCE OFF AL	IGN AUTO	DMC	10:34:5	1 AM Oct 10, 2019
enter	Gar	te: LO	NFE	PNO: Fast ++	. Trig: Exter #Atten: 14	rnal1 dB	#Avg Type.	RIVIS		TYPE WWWWWW DET A NNNN
) dB/di	Ref0 v Ref 2	ffset 29.1 dE 2 0.00 dBr r	3					N	/lkr1 12.2 -5	250 3 GH2 1.36 dBm
						Ĭ				
0.0										
.00										
0.0										
0.0										DL1 -19.02 dB
0.0						•1				
0.0		. 🛦 t	اللي المحالة	وشيد د الأسا						1.401.5
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0.0										
art 5. Res B	.000 GHz W 1.0 MI	Hz		#VB	SW 3.0 MHz	*		#Swee	Stop 26.00 s	18.000 GH
G							STATUS		•	



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20 MHz + 5.0 MHz - Channel Position M - Range 18000 to 26000 MHz



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20 MHz + 5.0 MHz - Channel Position M - Range 26000 to 38000 MHz

- Keysi	ght Spectrum	Analyzer - Swept SA								
ento	er Freq	50 Ω DC 32.0000000 Gate: L0	000 GHz	PNO: Fast ↔	SENSE:EXT SOUR	rnal1	IGN AUTO #Avg Type:	RMS	10:27:16 TF	AM Oct 10, 2019 IACE 1 2 3 4 5 6
0 dB/	Ref div Re	Offset 51.5 dE f 20.00 dBm	11 - 11 1 1	-Gain:High	#Atten: 0 d	IB 		N	/kr1 37.2 -36	39 0 GHz 3.19 dBm
10.0 -										
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0.0										DL1 -19.02 dB
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10.0 -	ية المراجعة (الرياس والمتعاط الأل	ويستعلق والمراجع	Latile production and the second	المرابعة من المنتخل المن ا	اللي المراجع ا مراجع من مراجع المراجع ا				
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L	26.000 0	<u> </u>							Ston 3	29 000 CH-
Res	BW 1.0 I	MHz		#VB	W 3.0 MHz	*		#Swee	ep 24.00 s	(24000 pts
SG							STATUS			



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Range 0.009 to 5000 MHz



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Range 5000 to 18000 MHz

🔤 Kej	ysight Spe	trum Analyzer - Sv	vept SA							
XI RI	L	RF 50 \$	2 DC		SENSE:INT SOUR	RCE OFF AI	IGN AUTO		12:58:20	8 PM Oct 08, 2019
npı	it Med	h Atten 10) dB	DNO: Fast in b	Trig: Exter	rnal1	#Avg Type	RMS	T	TYPE WWWWWW
		Gate: LO	NFE	IFGain:Low	#Atten: 10	dB				DETANNNN
		D-606						Ν	/kr1 14.1	29 9 GHz
10 dF	Rídiv	Ref 20.00	dBm						-5	1.85 dBm
Log					· · · ·	Y				
10.0										
0.00										
-10.0										
-20.0										DL1 -19.02 dBm
-30.0										
-40.0										
-50.0								♦'		
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	1						1			
-70.0										
						L				
Star	t 5.00) GHz							Stop '	8.000 GHz
же:	SBW	I.U IVIHZ		#VE	SW 3.0 MHZ	•		#Swee	ep 26.00 s	(26000 pts)
MSG							STATUS			



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Range 18000 to 26000 MHz

🔤 Ke	ysight Spect	trum Analyzer - Swept SA	1							
LXI R		RF 50 Ω DC			SENSE:INT SOUR	RCE OFF AL	IGN AUTO	DMC	12:50:36	PM Oct 08, 2019
Cer	iter Fre	Gate: LO	NFE	PNO: Fast ++ FGain:Low	. Trig: Exter #Atten: 2 c	mal1 IB	#Avg Type:	RWS	1	DET A N N N N N
10 di Log	B/div	Ref Offset 40.9 dl Ref 20.00 dBn	3					N	1kr1 25.9 -44	05 0 GHz 4.10 dBm
10.0										
0.00										
-10.0										
-20.0										DL1 -19.02 dBm
-30.0										
-40.0										
-50.0						an a fair an				
-60.0										
-70.0										
Sto.	+ 19.00	0.042							Stor (
stal #Re	s BW 1	.0 MHz		#VB	W 3.0 MHz	*		#Swee	stop 2 p 16.00 s	(16000 GHZ
MSG							STATUS			

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position B - Range 26000 to 38000 MHz

Keysigh	t Spectrum A	nalyzer - Swept SA								
RL	RF	50 Ω DC			SENSE:INT SOUR	RCE OFF AL	IGN AUTO		12:47:52	PM Oct 08, 2019
Center	Freq 3 G	ate: LO	NFE	PNO: Fast ↔ FGain:High	. Trig: Exter #Atten: 0 c	rnal1 IB	#Avg Type:	RMS		DET A NNNN
I0 dB/di	Ref v Ref	Offset 51.5 df 20.00 dBm	3 1			-	1	N	1kr1 37.2 -30	51 5 GHz).47 dBm
10.0										
0.00										
10.0										
20.0										DL1 -19.02 dBm
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50.0										
70.0										
Start 20 Res B	6.000 GI W 1.0 N	Hz 1Hz		#VB	W 3.0 MHz	*	STATUS	#Swee	Stop 3 ep 24.00 s	88.000 GHz (24000 pts



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Range 0.009 to 5000 MHz





Kej	ysight Spe	trum Analyzer - Swep	ot SA							
	tor Er	RF 50 Ω			SENSE:INT SOUR	RCE OFF AI	IGN AUTO	RMS	01:08:4 T	3 PM Oct 08, 2019 RACE 1 2 3 4 5 6
Cen		Gate: LO	NFE	PNO: Fast ++	. Trig: Exter #Atten: 10	rnal1 dB	ming type			TYPE WWWWW DET A N N N N N
10 dE	3/div	Ref Offset 29.1 Ref 20.00 di	l dB Bm					N	1kr1 14.1 -5	14 4 GHz 1.16 dBm
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10.0										
0.00										
-10.0										
20.0										DL1 -19.02 dBm
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-50.0								1		
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-00.0										
-70.0										
Star #Re:	t 5.00 s BW) GHz 1.0 MHz		#VB	W 3.0 MHz	*	1	#Swee	Stop stop 26.00 s	18.000 GHz (26000 pts)
ISG							STATUS			



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Range 18000 to 26000 MHz

🛄 Ke	ysight Spe	ctrum Anal	lyzer - Swept SA								
LXI R	L	RF	50 Ω DC			SENSE:INT SOUR	RCE OFF AL	IGN AUTO	DMC	01:11:14	PM Oct 08, 2019
Cen	iter Fr	eq 22 Gate	.0000000 :: LO	NFE	PNO: Fast ++- FGain:Low	. Trig: Exter #Atten: 2 c	mal1 IB	#Avg Type:	RMS	1	DET A NNNN
10 di Log	B/div	Ref Of Ref 2	fset 40.9 dE 0.00 dBm	3					N	1kr1 25.8 -43	77 0 GHz 3.62 dBm
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0.00											
-10.0											Did 10 00 10-
-20.0											DE1 -19.02 dBm
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-60.0											
-70.0											
Star #Re:	t 18.0 s BW	00 GH2 1.0 MH	<u>z</u> Iz		#VB	W 3.0 MHz	*		#Swee	Stop 2 p 16.00 s	6.000 GHz (16000 pts)
MSG								STATUS			

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position M - Range 26000 to 38000 MHz

Keysight	t Spectrum Analyzer - S	Swept SA							
RL	RF 50	Ω DC		SENSE:INT SOUR	CE OFF AL	LIGN AUTO		01:13:4	2 PM Oct 08, 2019
enter	Freq 32.000 Gate: LO	000000 GH2 NFE	Z PNO: Fast ↔ IFGain:High	. Trig: Extern #Atten: 0 dl	nal1 B	#Avg Type:	RMS	1	TYPE WWWWW DET A NNNN
0 dB/div	Ref Offset 5 v Ref 20.00	51.5 dB dBm					N	/lkr1 37.2 -30	43 5 GHz 0.05 dBm
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).00									
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'U.U									
tart 26 Res B	6.000 GHz W 1.0 MHz		#VB	SW 3.0 MHz*			#Swee	Stop: ep 24.00 s	38.000 GHz (24000 pts)
SG						STATUS			



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Range 0.009 to 5000 MHz



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Range 5000 to 18000 MHz

Keysight	Spectrum Analyzer - Swept	SA		asues turi equi				01.05.10	
Center	Freq 11.50000	0000 GHz		SENSE:INT SOUP	(CE OFF AL	#Avg Type:	RMS	01:25:19 TR	ACE 1 2 3 4 5 (
orner	Gate: LO	NFE	PNO: Fast 🔸	. Trig: Exter	nal1	•		1	
			-Gain:Low	#Atten. To	ub			11	
	Ref Offset 29.1	dB					IV	-51	208 GH2 167 dBm
- ^{og} (Rei 20.00 uB			,					
10.0									
0.00									
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70.0									
Start 5.0	000 GHz		#\/B	W 2 0 MU-			#D	Stop 1	8.000 GHz
res Bl	N 1.0 MIMZ		#VB	WV J.U WIMZ			#Swee	:p 20.00 S	(20000 pts
ISG						STATUS			



Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Range 18000 to 26000 MHz

- Ke	ysight Spect	rum Analyzer - Swept S	A							
LXI R		RF 50 Ω D	c		SENSE:INT SOUR	RCE OFF AL	IGN AUTO	DMC	01:28:18	PM Oct 08, 2019
Cen	iter Fre	Gate: LO	NFE	PNO: Fast ++-	. Trig: Exter #Atten: 2 c	mal1 IB	#Avg Type.	RIVIS	1	DET A N N N N N
10 di Log	B/div	Ref Offset 40.9 d Ref 20.00 dBi	iB n					N	1kr1 25.9 -44	01 0 GHz I.35 dBm
10.0										
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. 0.0										
Star #Re	t 18.00 s BW 1	0 GHz .0 MHz		#VB	W 3.0 MHz	*		#Swee	Stop 2 p 16.00 s	6.000 GHz (16000 pts)
MSG							STATUS			

Antenna A - LTE Modulation 64QAM - LTE Carrier Bandwidth 20.0 MHz - Channel Position T - Range 26000 to 38000 MHz

Keysight S	pectrum Analyzer - S	vept SA							
RL	RF 50 :	2 DC		SENSE:INT SOUR	RCE OFF AL	IGN AUTO		01:30:4	I PM Oct 08, 2019
Center l	Freq 32.000	000000 GHz		Trig: Exter	mal1	#Avg Type:	RMS	T	TYPE WWWWWW
	Gate: LO	NFE	IFGain:High	#Atten: 0 c	B				DETANNNN
			-				Ν	/kr1 36 9	05 0 GHz
0.40/40	Ref Offset 5	1.5 dB						-30	0.27 dBm
.og	Rei 20.00				•			-	
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10.0									
									DL1 -19.02 dBm
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start 26.	000 GHz							Stop 3	8.000 GHz
Res BW	1.0 MHz		#VB	W 3.0 MHz	*		#Swee	ep 24.00 s	(24000 pts)
SG						STATUS		-	
L Sec. 11						40.10			
Limit						-19dB	m		



2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055 FCC CFR 47 Part 90, Clause 90.213

2.5.2 Date of Test and Modification State

11 October 2019 - 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 Temperature	22.6°C
Relative Humidity	49.7%

2.5.5 Test Method

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

2.5.6 Test Results

Configuration B

Maximum Output Power 36.00 dBm

Tomperatura	Voltage	Frequency Error (Hz)
remperature	voltage	Channel Position M
-30°C	120.0 V AC 60 Hz	9.92
-20°C	120.0 V AC 60 Hz	10.88
-10°C	120.0 V AC 60 Hz	15.90
0°C	120.0 V AC 60 Hz	10.13
+10°C	120.0 V AC 60 Hz	7.42
+20°C	102.0 V AC 60 Hz	10.50
+20°C	120.0 V AC 60 Hz	8.03
+20°C	138.0 V AC 60 Hz	11.79
+30°C	120.0 V AC 60 Hz	9.14
+40°C	120.0 V AC 60 Hz	13.21
+50°C	120.0 V AC 60 Hz	10.13

<u>Remarks</u>

Single carrier, 64QAM, bandwidth 20MHz



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_						

Limit	90.213 Note 10: Except for DSRCS equipment in the 5850–5925 MHz band, frequency stability is to be specified in the station authorization. In the absence of test limits, the Frequency Stability has been tested and recorded in accordance with 2.1055.
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2.6 RADIATED EMISSIONS

2.6.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1053 FCC CFR 47 Part 90, Clause 90.1323

2.6.2 Date of Test and Modification State

10 October 2019 - Modification State 0

2.6.3 Test Equipment Used

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

2.6.4 Environmental Conditions

Ambient Temperature	19.9°C
Relative Humidity	58.4%

2.6.5 Test Method

The test was applied in accordance with test method requirements of ANSI C63.26-2015/TIA-603-E-2016.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within the chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both Horizontal and Vertical Polarisations.

The Applicant declared that the highest internally generated frequency would be up to 4000MHz and so the upper limit for measurement was calculated at 10 times this, which is 40GHz.

Emissions identified within the range 30MHz - 40GHz were then formally measured using a Peak detector as the worst case.

In the frequency Range 30MHz - 40GHz, measurements were performed with a resolution bandwidth of 1MHz.

All measurements were performed at a 3m distance unless otherwise stated.



Determination of Spurious Emission Limit

The limits given in the standard are converted from EIRP to field strength using equation c) in ANSI C63.26 clause 5.2.7

 $EIRP[dBm] + 95.2 = E[dB\mu V/m]$, for measurement distance (d) = 3 m.

For example

 $-40[dBm] + 95.2 = 55.2[dB\mu V/m]$, measurement distance (d) = 3m

The limits which are displayed in the plots are for ERP which is 2.15dB higher than stated above for EIRP. When assessing the plots for compliance, the limit needs to be reduced accordingly.

When testing in-band the most stringent limit was applied.

This limit has been used to determine Pass or Fail for the spurious emissions measured and detailed in the following results.

2.6.6 Test Results

Configuration A

Maximum Output Power 36.00 dBm





Antenna - LTE Modulation QPSK - LTE Carrier Bandwidth 20 MHz - Channel Position B - Band <u>1 - Range 30MHz-40GHz</u>









Antenna - LTE Modulation QPSK - LTE Carrier Bandwidth 20 MHz - Channel Position T - Band 3 - Range 30MHz-40GHz

Maximum Output Power 20 MHz, 36.00 dBm and 5 MHz, 30 dBm





Remarks

No emissions were measured.



<u>Limit</u>

Limit

43 + 10log(P) = -13 dBm = 82.2 dBuV/m



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 Po	ower and Peak to Avera	ge Ratio - Conducted	1	[(i,	<u> </u>
Hygrometer	Rotronic	Ă1	2138	12	05-Mar-2020
Network analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
Calibration unit	Rohde & Schwarz	ZV Z54	4368	12	22-Oct-2019
Analyser	Keysight	N9030A	4654	12	22-Oct-2019
Attenuator	Weinschel	48-40-43LM	5134	12	07-Nov-2019
AC power source	ITECH	IT7324	5227	-	O/P Mon
DMM	ISO Tech	DM101	2424	12	12-Dec-2019
Occupied Bandwidth					
Hygrometer	Rotronic	A1	2138	12	05-Mar-2020
Network analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
Calibration unit	Rohde & Schwarz	ZV Z54	4368	12	22-Oct-2019
Analyser	Keysight	N9030A	4654	12	22-Oct-2019
Attenuator	Weinschel	48-40-43LM	5134	12	07-Nov-2019
AC power source	ITECH	IT7324	5227	-	O/P Mon
DMM	ISO Tech	DM101	2424	12	12-Dec-2019
Band Edge					
Hygrometer	Rotronic	A1	2138	12	05-Mar-2020
Network analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
Calibration unit	Rohde & Schwarz	ZV Z54	4368	12	22-Oct-2019
Analyser	Keysight	N9030A	4654	12	22-Oct-2019
Attenuator	Weinschel	48-40-43LM	5134	12	07-Nov-2019
AC power source	ITECH	IT7324	5227	-	O/P Mon
DMM	ISO Tech	DM101	2424	12	12-Dec-2019
Transmitter Spurious Emis	ssions				-
Hygrometer	Rotronic	A1	2138	12	05-Mar-2020
Network analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
Calibration unit	Rohde & Schwarz	ZV Z54	4368	12	22-Oct-2019
Analyser	Keysight	N9030A	4654	12	22-Oct-2019
Attenuator	Weinschel	48-40-43LM	5134	12	07-Nov-2019
AC power source	ITECH	IT7324	5227	-	O/P Mon
DMM	ISO Tech	DM101	2424	12	12-Dec-2019
Attenuator	Weinschel	48-20-43LM	5133	12	07-Nov-2019
HPF	K&L	11SH10- 4000/X18000	4599	12	05-Sep-2020
Cable attenuator	Aralab	CSF6767C-C2S6500	5175	-	O/P Mon
Waveguide	FMI UK	18-26GHz	-	-	O/P Mon
Waveguide	FMI UK	26-40GHz	-	-	O/P Mon
Frequency Stability					
Hygrometer	Rotronic	A1	2138	12	05-Mar-2020
Network analyser	Rohde & Schwarz	ZVA 40	3548	12	17-Oct-2019
Calibration unit	Rohde & Schwarz	ZV Z54	4368	12	22-Oct-2019
Analyser	Keysight	N9030A	4654	12	22-Oct-2019
Attenuator	Weinschel	48-40-43LM	5134	12	07-Nov-2019
AC power source	ITECH	IT7324	5227	-	O/P Mon



Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
DMM	ISO Tech	DM101	2424	12	12-Dec-2019
Climatic chamber	Votsch	VT4002	0161	12	O/P Mon
Thermometer	Digitron	T208	2340	12	22-Nov-2019
Radiated Emissions					
Antenna 18-40GHz (Double Ridge Guide)	Link Microtek Ltd	AM180HA-K-TU2	230.00	24.00	02-May-2020
Antenna with permanent attenuator (Bilog)	Schaffner	CBL6143	287.00	24.00	15-May-2020
Pre-Amplifier	Phase One	PS04-0086	1533.00	12.00	08-Feb-2020
18GHz - 40GHz Pre-	Phase One	PSO4-0087	1534.00	12.00	05-Feb-2020
Amplifier					
Screened Room (5)	Rainford	Rainford	1545.00	36.00	23-Jan-2021
Turntable Controller	Inn-Co GmbH	CO 1000	1606.00	0.00	TU
Hygromer	Rotronic	A1	2677.00	12.00	20-Feb-2020
Comb Generator	Schaffner	RSG1000	3034.00	0.00	TU
Cable 1503 2M 2.92(P)m 2.92(P)m	Rhophase	KPS-1503A-2000- KPS	4293.00	12.00	26-Oct-2019
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526.00	6.00	11-Dec-2019
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117.00	4722.00	12.00	05-Mar-2020
Mast Controller	Maturo Gmbh	NCD	4810.00	0.00	TU
Tilt Antenna Mast	Maturo Gmbh	TAM 4.0-P	4811.00	0.00	TU
EmX Emissions	TUV SUD	EmX	5125.00	0.00	N/A -
Software		V.V1.4.8.3			Software
1.5m 40GHz RF Cable	Scott Cables	KPS-1501-2000-KPS	5127.00	6.00	11-Dec-2019
8 Meter Cable	Teledyne	PR90-088-8MTR	5212.00	12.00	30-Aug-2020
Test Receiver (ESW)	Rohde & Schwarz	ESW44	5351.00	12.00	31-Jul-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		± 2.3 dB
Conducted Emissions	30 MHz to 20 GHz Amplitude		± 3.2 dB
Frequency Stability	30 MHz to 2 GHz		± 5.0 Hz
Occupied Bandwidth	Up to 20 MHz Bandwidth	5 MHz Bandwidth	± 11547 Hz
		20 MHz Bandwidth	± 46188 Hz
Band Edge	30 MHz to 20 GHz Amplitude		±2.3 dB



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 A, B			
Product	Product No	R-State	Serial No
Radio 2208 B48	KRC 161 711/1	R1B	D827120517
Software Version:	CXP9034711/2	Revision:	R1K