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Report On

FCC Testing of the Nokia 7705 SAR-Hmc NA(3HE12473AAA) Base Station in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 96E COMMERCIAL-IN-CONFIDENCE

FCC ID: AS57705SARHMC-2 Contain FCC ID: N7NMC74B

PREPARED BY APPROVED BY

DATED

Jose Martinez Test Personnel

Drysdale

Scott Drysdale Authorised Signatory

06 September 2023



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SECTION 1

REPORT INFORMATION



1.1 REPORT DETAILS

Manufacturer	Nokia Canada Inc
Address	600 March Road Ottawa Ontario K2K 2E6 Canada
Product Name	Nokia 7705 SAR-Hmc NA
Product Number	3HE12473AAA
Serial Number(s)	NS213860190
Software Version	TIMOS-B-21-10.B1-7
Hardware Version	V.1.2
Test Specification/Issue/Date	FCC CFR 47 Part 2: 2017 FCC CFR 47 Part 96: 11/29/2021
Product Name	NOKIA 7705 SAR-Hmc NA
Start of Test	17 November, 2021
Finish of Test	23 February 2022
Name of Tester	Jose Martinez
Report issue / Revisions	000 – 11 th March 2022 001 – Sept 6, 2023 – Revisions to account for Category B operation (SD)
Related Document(s)	KDB 971168 D01 v03r01 KDB 662911 D01 v02r01 KDB 940660 D01 Part 96 CBRS Eqpt v01 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 FCC CFR 47 Part 96. The sample tested was found to comply with the requirements defined in the applied rules.

Tester

Jose Martinez



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results for each configuration, in accordance with FCC CFR 47 Part 2, <u>FCC</u> <u>CFR 47 Part 96E</u> is shown below.

Continn	Specif	ication Clause	Toot Deparintion	Deput
Section	FCC CFR 47 Part 2	FCC CFR 47 Part 96	Test Description	Result
2.1	<u>§2.1046</u>	<u>§96.41 (b)(c)(g)</u>	Peak Output Power and Peak to Average Ratio – Conducted, PSD	Pass
2.2	<u>§2.1049</u>	<u>§96.41 (e)(3)</u>	Occupied Bandwidth	Pass
2.3	<u>§2.1051</u>	<u>§96.41 (e)(3)</u>	Band Edge	Pass
2.4	<u>§2.1051</u>	<u>§96.41 (e)(1)</u>	Transmitter Spurious Emissions	Pass
2.5	<u>§2.1055(d)</u>	-	Frequency Stability	Pass
2.6	<u>§2.1051</u>	-	Radiated Spurious Emission	Pass

Tahle	1 _Tos	t Summarv
Table	1 - 1 - 25	L OUTINIAI V



1.3 CONFIGURATION DESCRIPTION

1.3 CONFIGURATION DESCRIPTION

The NOKIA 7705 SAR-Hmc NA (3HE12473AAA) LTE Test Model according to Table 3 in Band 48 (3550 MHz – 3700 MHz).

The LTE Test Models (as defined in 3GPP TS 36.141) were used to represent QPSK, and 16QAM modulation, respectively.

TX test cases: Maximum Conducted Output Power, Maximum Power Spectral Density, Spurious Emissions at Antenna Terminals (±1MHz) and Conducted Spurious Emissions, measurements were performed on the RF Port. All testing was performed with the EUT transmitting at maximum RF power unless otherwise stated.

The EUT was powered via Nokia HV power supply.



1.4 **DECLARATION OF BUILD STATUS**

Table 2 – Declaration							
	MAIN EUT						
MANUFACTURING DESCRIPTION							
MANUFACTURER	Nokia						
ТҮРЕ	Remote Radio Base Station						
PART NUMBER	3HE12473AA						
SERIAL NUMBER	NS213860190						
HARDWARE VERSION	V.1.2						
SOFTWARE VERSION	TIMOS-B-21-10.B1-7						
TRANSMITTER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)						
RECEIVER OPERATING RANGE	B48 3550 – 3700 MHz (TDD)						
COUNTRY OF ORIGIN	Mexico						
INTERMEDIATE FREQUENCIES	DL: 110 – 150MHz, UL: 40 – 80MHz						
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	LTE 5M00 W7D 10M0 W7D 15M0 W7D 20M0 W7D						
MODULATION TYPES: (i.e. GMSK, QPSK)	LTE: QPSK, 16QAM						
Antenna Gain	7.0						
HIGHEST INTERNALLY GENERATED FREQUENCY	3.7 GHz						
OUTPUT POWER (W or dBm)	20dBm + 7 dBi (Category A) or 24 dBi (Category B)						
FCC ID	AS57705SARHMC-2						
INDUSTRY CANADA ID	NA						
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Nokia 7705 SAR-Hm series includes feature-rich IP/MPLS service routers in a ruggedized and compact platform. With these routers, operators are able to support IP VPN, VPLS, and VPWS services over wireless networks, enabling an end-to-end, seamless, IP/MPLS service offering between wireless and wired devices. This enables critical infrastructure operators to fully realize the promise of smart grids, smart cities, and public safety mobile broadband to enhance safety, efficiency and responsiveness. The 7705 SAR-Hm series can be used in fixed or mobile locations for a variety of applications, such as supervisory control and data acquisition (SCADA), security monitoring, workforce voice and data connectivity in offices or vehicles, mass transit, fleet management, and vehicle remote control and monitoring.						

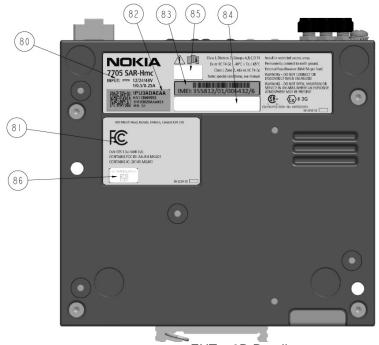


1.5 PRODUCT INFORMATION

1.5.1 Technical Description

The Equipment Under Test (EUT) NOKIA 7705 SAR-Hmc NA (3HE12473AAA) is an Nokia radio Unit working in the public mobile service (3550-3700 MHz) band which provides communication connections to (Band) network. The NOKIA 7705 SAR-Hmc NA (3HE12473AAA) operates from a Nokia HV PSU 100V-240V.

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



EUT – 3D Rending



1.5.2 EUT configurations

Test No.	BW (MHz)	Resource Block	Resource Block Offset	MOD	Test No.	BW (MHz)	Resource Block	Resource Block Offset	MOD
1		1	0		29		1	0	
2		1	49		30		1	25	
3		1	99		31		1	49	
4		50	0	QPSK	32		25	0	QPSK
5		50	24		33		25	12	
6		50	50		34		25	25	
7	20	100	0		35	10	50	0	
8	20	1	0		36	10	1	0	
9		1	49		37		1	25	
10		1	99		37		1	49	
11		50	0	16-QAM	38		25	0	16-QAM
12		50	24		39		25	12	
13		50	50		40		25	25	
14		100	0		41		50	0	
15		1	0		42		1	0	
16		1	37		43		1	12	
17		1	74		44		1	24	
18		36	0	QPSK	45		12	0	QPSK
19		36	20		46		12	7	
20		36	39		47		12	13	
21	15	75	0		48	5	25	0	
22	15	1	0		49	J	1	0	
23		1	37		50		1	12	
24		1	74		51		1	24	
25		36	0	16-QAM	52		12	0	16-QAM
26		36	20		52		12	7	
27		36	39		53		12	13	
28		75	0		54		25	0	
Note 2	1. Bold le	etters, the w	orst-case sce	nario of test	t cases aco	cording to	power cond	ducted measu	urements

Table 3 – EUT Test Configurations



1.5.3 Test Procedure

1.5.3.1 TDD Synchronization

Gate View Sweep Time	Gate Delay	Gate length	Sweep Time
(ms)	(ms)	(ms)	(s)
6.4	2.7	2.9	

1.5.3.1 Conducted Power

Spectrum Analyzer	Setting
RBW	1- 5% of OBW
VBW	3 x OBW
Span	1.5 x OBW
Seep	>2xSpan/RBW
Detector	RMS
BP integration	10MHz
Detector	RMS
Trace mode	Trace Averaging (RMS) over 100 sweeps

1.5.4 Frenquncy List

BW(MHz)	Lowest (MHz)	Middle (MHz)	Highest (MHz)
20	3560.0	3625.0	3690.0
15	3557.5	3625.0	3692.5
10	3555.0	3625.0	3695.0
5	3552.5	3625.0	3697.5

Table 4 – EUT Frequency per BW



1.5.5 Worst-Case Scenario

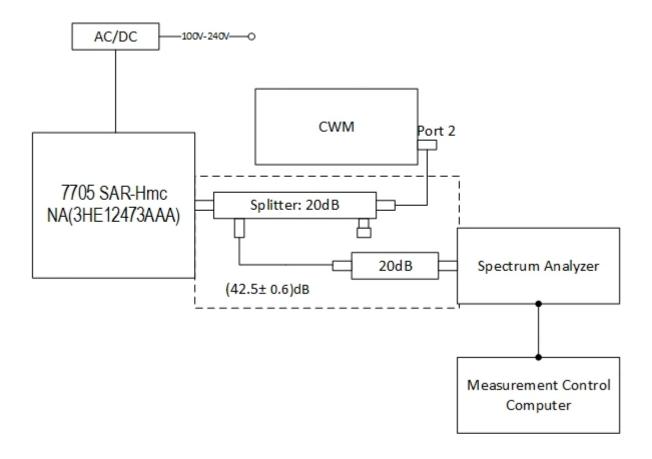
Testing was performed for all configurations. All EUT configurations were measured and only the worst-case scenario for each measurement is presented in graph format.

20MHz		15MHz		10MHz		5MHz	
(dBm/1MHz)	(dBm/10MHz)	(dBm/1MHz)	(dBm/10MHz)	(dBm/1MHz)	(dBm/10MHz)	(dBm/1MHz)	(dBm/10MHz)
6.81	16.87	7.93	18.03	10.98	20.42	12.91	19.34

Table 5 – Worst Case QPSK of Power Conducted Measurements of Table 3



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.

FCC Measurement Facility Accreditation Designation Number: CA6845 TUV SUD Canada (Ottawa)

1.8 DEVIATION FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.9 MODIFICATION RECORD

No modifications were made to the EUT during testing.

1.10 ALTERNATIVE TEST SITE

Under our Accreditation, TÜV SÜD Canada, Laval conducted the following tests at Nokia in Ottawa.

Test Name	Name of Engineer(s)
Peak Output Power and Peak to Average Ratio – Conducted, PSD	Jose Martinez
Occupied Bandwidth	Jose Martinez
Band Edge	Jose Martinez
Transmitter Spurious Emissions	Jose Martinez
Frequency Stability	Jose Martinez
Radiated Emissions	Christopher Richer



SECTION 2

TEST DETAILS



2.1 PEAK OUTPUT POWER AND PEAK TO AVERAGE RATIO - CONDUCTED

2.1.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1046 FCC CFR 47 Part 96, Clause 96.41 (b)(c)(g)

2.1.2 Date of Test and Modification State

14 January 2021 – Modification State 0 03 February 2021 – Modification State 0

2.1.3 Test Equipment Used

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

2.1.4 Environmental Conditions

Ambient Temperature21°CRelative Humidity20%

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. EIRP values were calculated by adding the Port A and Port B antenna gain of 2.6 dBi and the Port C and Port D antenna gain of 3.1 dBi

2.1.6 Test Results



2.1.6.1 Worst-case measurements

Table 3 (Category A operation)								
Bandwidth (MHz)	Conducted Average Power (dBm/1MHz)	Conducted Average Power (dBm/10MHz)	EIRP (dBm/1MHz) <note 1=""></note>	Limit (dBm/1MHz) <note 2=""></note>	EIRP (dBm/10MHz) <note 1=""></note>	Limit (dBm/10MHz) <note 2=""></note>	Results	
20	6.81 <note 3=""></note>	16.87 <note 3=""></note>	13.81	20	23.87	30	Pass	
15	7.93 <note 4=""></note>	18.03 <note 4=""></note>	14.93	20	25.03	30	Pass	
10	10.98 <note 5=""></note>	20.42 <note 5=""></note>	17.98	20	27.42	30	Pass	
5	12.91 <note 6=""></note>	19.38 <note 6=""></note>	19.91	20	26.38	30	Pass	

Table 6 – Worst-Case: QPSK Modulation – Conducted Power Measurements of test cases in
Table 3 (Category A operation)

Note 1. EIRP (worst case) = Power (dBm/xMHz) + Gain(7.0 dBi) as per section 2.3 in <u>412172 D01</u>

Note 2. Limit according Category A CBSD of § 96.41 (b)

Note 3. Test case # 5 of Table 3 (Frequency: 3560Mz).

Note 4. Test case # 21 of Table 3 (Frequency: 3557.5MHz)

Note 5. Test case # 35 of Table 3 (Frequency: 3695MHz)

Note 6. Test case #48 of Table 3 (Frequency: 3697.5MHz)



			(Catogory 2	/			
Bandwidth (MHz)	Conducted Average Power (dBm/1MHz)	Conducted Average Power (dBm/10MHz)	EIRP (dBm/1MHz) <note 1=""></note>	Limit (dBm/1MHz) <note 2=""></note>	EIRP (dBm/10MHz) <note 1=""></note>	Limit (dBm/10MHz) <note 2=""></note>	Results
20	6.81 <note 3=""></note>	16.87 <note 3=""></note>	30.81	37	40.87	47	Pass
15	7.93 <note 4=""></note>	18.03 <note 4=""></note>	31.93	37	42.03	47	Pass
10	10.98 <note 5=""></note>	20.42 <note 5=""></note>	34.98	37	44.42	47	Pass
5	12.91 <note 6=""></note>	19.38 <note 6=""></note>	36.92	37	43.38	47	Pass

Table 7 – Worst-Case: QPSK Modulation – Conducted Power Measurements of test cases in Table 3 (Category B Operation)

Note 1. EIRP (worst case) = Power (dBm/xMHz) + Gain(24.0 dBi) as per section 2.3 in <u>412172 D01</u> for category B operation.

Note 2. Limit according Category B CBSD of § 96.41 (b)

Note 3. Test case # 5 of Table 3 (Frequency: 3560Mz).

Note 4. Test case # 21 of Table 3 (Frequency: 3557.5MHz)

Note 5. Test case # 35 of Table 3 (Frequency: 3695MHz)

Note 6. Test case #48 of Table 3 (Frequency: 3697.5MHz)

Bandwidth (MHz)	PAPR (@.1%)	Limit	Result
20	7.1	13	Pass
15	6.7	13	Pass
10	6.4	13	Pass
5	6.1	13	Pass

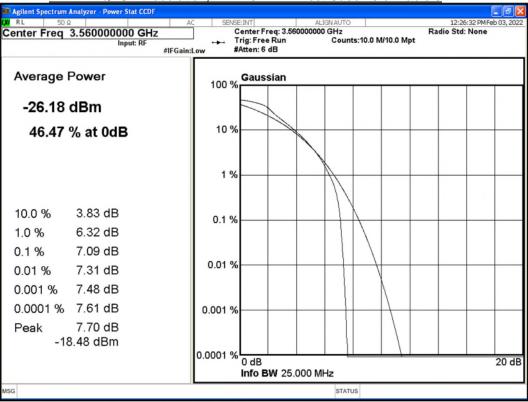


2.1.6.1.1.1 Lower Channel: 3560MHz

and Spa	50 Ω an 30.00 Gate: L0	0000000 MHz Input: RF PNO: Fast IFGain:Low	AC SENSE:1	Avg	ALIGNAUTO Type: Pwr(RMS)	TYPE V	23456 WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	Band Adjust Band/Interva
0 dB/div	Ref Offset Ref 42.2				Mkr1 Band Pov	3.560 00 ver 19.31		Spa 30.00000000 MH
32.2 22.2 12.2								Band/Interv Le 3.545000000 GH
20 .80 7,8			\					Band/Inter Rig 3.5750000000 G
7.8								
	56000 GH2 200 kHz	-	BW		#Sweep	Span 40. 5.00 s (12	00 MHz 00 pts)	
KR MODE TF 1 N 1 2 N 1 3 N 1 4 5 6	f	X 3.560 00 GHz 3.560 00 GHz 3.560 00 GHz	0.17 dBm	FUNCTION Band Power Band Power Band Power	FUNCTION WIDTH 30.00 MHz 10.00 MHz 1.000 MHz	16.	ALUE 31 dBm 87 dBm 81 dBm	
0 7 8 9 0								

Conducted Output Power – QPSK Modulation, BW: 20MHz – Test Case 35 of Table 3





PARP – QPSK Modulation, BW: 20MHz – Test Case #5 of Table 3



2.1.6.1.1.2 Lower Channel: 3557.5MHz

E 1 2 3 4 5 6	TRAC	ALIGN AUTO ype: Pwr(RMS)		Trig: Free Ru	Hz		50 Ω 3.55750 Gate: L0	
50 GHz	3.557			Atten: 10 dB	Gain:Low	t 42.2 dB		3/div
	_							
1200 pts) NVALUE	5.00 s (*	FUNCTION WIDTH		Y		×	200 kHz	BW 2
	1	30.00 MHz 10.00 MHz 1.000 MHz	Band Power	1.05 dBm	0 GHz	3.557	f f f	N 1 N 1 N 1
	50 GHz 33 dBm 0.00 MHz 1200 Uts 9.30 dBm 9.30 dBm 9.30 dBm	\$ 3.557 50 GHz wer 7.93 dBm \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	Span 40.00 MHz Span 40.00 MHz #Sweep 5.00 s (1200 µts) 10.00 MHz	Avg Type: Pwr(RMS) TRACE 123456 n Trype Wwwwwwww DET A N NNN DET A N NNN DET A N NNN DET A N NNN Mkr3 3.557 50 GHz Band Power 7.93 dBm Span 40.00 MHz Span 40.00 MHz #Sweep 5.00 s (1200 pts) FUNCTION WALLE Band Power 19.30 dBm Band Power 19.30 dBm	Avg Type: Pwr(RMS) TRACE 123456 Trig: Free Run Atten: 10 dB DYPE WWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWWW	GHz Avg Type: Pwr(RMS) TRACE [123456] PN0: Fast C Trig: Free Run Atten: 10 dB Mkr3 3.557 50 GHz Band Power 7.93 dBm Mkr3 3.557 50 GHz Band Power 7.93 dBm Span 40.00 MHz #VBW #Sweep 5.00 s (1200 pts) So GHz 1.05 dBm Band Power 50 GHz 1.05 dBm Band Power 10.05 dBm Band Power 10.00 MHz 10.05 dBm Band Power 10.00 MHz 10.05 dBm Band Power 10.00 MHz 10.05 dBm Band Power 10.00 MHz	O000000 GHz Input: RF PN0: Fast Irgain:Low Trig: Free Run Mkr3 3.557 50 GHz 0 dBm Mkr3 3.557 50 GHz 0 dBm Band Power 7.93 dBm Span 40.00 MHz X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X X	3.557500000000 GHz Avg Type: Pwr(RMS) TRACE 12.3456 Gate: L0 Input: RF PN0: Fast Trig: Free Run Atten: 10 dB Mkr3 3.557 50 GHz Ref 0ffset 42.2 dB Mkr3 3.557 50 GHz Ref 42.20 dBm Mkr3 3.557 50 GHz Span 40.00 MHz To 50 GHz Span 40.00 MHz Span 40.00 MHz To 50 GHz Span 40.00 MHz Span 40.00 MHz To 50 GHz Span 40.00 MHz To 50 GHz To 50 GHz Span 40.00 MHz Span 40.00 MHz To 50 GHz Span 40.00 MHz To 50 GHz To 50 GHz To 50 GHz Span 40.00 MHz

Conducted Output Power – QPSK Modulation, BW: 15MHz – Test Case #21 of Table 3



	tion, BVV: 15MHZ – Test Case #21 of Table 3	
Agilent Spectrum Analyzer - Power Stat CCDF S0 Ω Center Freq 3.557500000 GHz	AC SENSE:INT ALIGNAUTO 12:18:11 PMFeb 03 Center Freq: 3.557500000 GHz Radio Std: None	
Input: RF	─┘ Trig: Free Run Counts:10.0 M/10.0 Mpt in:Low #Atten: 6 dB	_
Average Power	100 % Gaussian	
-22.86 dBm		
43.95 % at 0dB	10 %	
	1 %	_
10.0 % 4.16 dB 1.0 % 6.41 dB	0.1 %	_
0.1 % 6.73 dB 0.01 % 6.82 dB 0.001 % 6.89 dB	0.01 %	_
0.0001 % 6.93 dB Peak 7.48 dB	0.001 %	_
-15.38 dBm	0.0001 % 0 dB 2000 MHz 2000 MHz) dB
MSG	STATUS	

PARP – QPSK Modulation, BW: 15MHz – Test Case #21 of Table 3

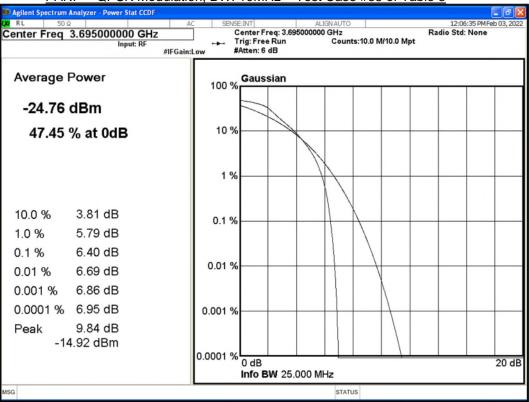


2.1.6.1.2 Bottom Channel: 3695MHz

<u>35 of Table 3</u>	<u> Case #3</u>	- Test	<u>/: 10MHz -</u>	lation, BV	SK Modu	<u>ver – QF</u>	<u>utput Pow</u>	ed Ou	duct	onc
							zer - Swept SA		Spect	gilent
Marker	M Jan 14, 2022 E 1 2 3 4 5 6 E WWWWWWWW T A A N N N N	TRAC	ALIGNAUTO ype: Pwr(RMS)	Avg T	C SENSE:1		00000000 (50 Ω 3.69500 Sate: L0		arke
Select Marker 2	00 GHz	3.695			Atten: 10 dB	FGain:Low	et 42.2 dB	Ref Offset		
		/er 20.4	Band Pov				.20 dBm	Ref 42.2	iv	dB/di
										2
Norma			_					_		.2
			_		2-					.2
		_			8 '	1				20
Delt			_	1				_		06
								_		.8
	F			\ \				_		.8
Fixed		~							_	.8
Tixea			_							.8
	0.00 MHz	Snan 4					H7 ^	500 GH	3 60	
0	1200 pts)		#Sweep			#VBW		00 kHz		
Ŭ	IN VALUE	FUNCTIO	FUNCTION WIDTH	FUNCTION	Y		×	SCL	E TRC	R MOD
	20.42 dBm 20.42 dBm		30.00 MHz 10.00 MHz	Band Power Band Power		00 GHz 00 GHz		f	1	N
	10.98 dBm		1.000 MHz	Band Power		00 GHz		f	1	N
Properties										i
										1
Mor										
1 of										
			STATUS						_	
			010100							

~ ~ ~ 4 D ... ODCK Madulation DW/ 40MULT To . . HOF (Table O





PARP – QPSK Modulation, BW: 10MHz – Test Case #35 of Table 3

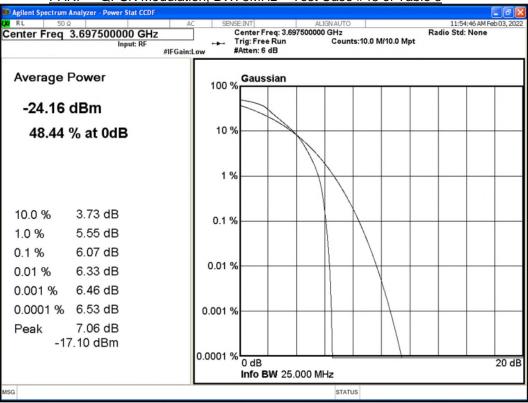


2.1.6.1.3 Top Channel: 3697.5MHz

		SENSE:INT	ALIGNAUTO Avg Type: Pwr(RMS	S) TRACE 1 2 TYPE W	23456 Ma	arker
Ref Offset 4 0 dB/div Ref 42.20	2.2 dB			r3 3.697 50 ower 12.91	GHz	t Marker 3
og 32.2 22.2		∂ 3				Norm
.20						Del
7.8				*****		Fixe
enter 3.69750 GHz	#VBW		#Swee		0 pts) UE	c
Res BW 200 kHz	X 2 507 50 CU In		Dames 20.00 MI	- 40.2		
	X 3.697 50 GHz 3.697 50 GHz 3.697 50 GHz	6.16 dBm Band 6.16 dBm Band 6.16 dBm Band	Power 10.00 MH	z 19,3	3 dBm 3 dBm 1 dBm Pr	opertie

Conducted Output Power – QPSK Modulation, BW: 5MHz – Test Case # 48 of Table 3





PARP – QPSK Modulation, BW: 5MHz – Test Case #48 of Table 3



2.2 OCCUPIED BANDWIDTH

2.2.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1049 FCC CFR 47 Part 96, Clause 96.41 (e)(3)

2.2.2 Date of Test and Modification State

17 Novemberl 2021 - Modification State 0 18 Novemberl 2021 - Modification State 0 25 Novemberl 2021 - Modification State 0 26 Novemberl 2021 - Modification State 0 29 Novemberl 2021 - Modification State 0

2.2.3 Test Equipment Used

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

2.2.4 Environmental Conditions

Ambient Temperature	22°C
Relative Humidity	19%

2.2.5 Test Method

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

2.2.6 Test Results

Maximum Output Power 18 dBm/10MHz

Table 9 – Worst Case of OBW of Measurements of tests cases in Table 3

20(MHz)	15 (MHz)	10 (MHz)	5 (MHz)
QPSK	QPSK	QPSK	QPSK
17.9	13.4	8.9	4.5
Note 1	Note 2	Note 3	Note 4
Note 1. Test cas	e No. 7 in Table 3		
Note 2. Test cas	e No. 21 in Table	3	
Note 3. Test cas	e No. 35 in Table	3	
Note 4. Test cas	e No. 49 in Table	3	



2.2.6.1 17OBW – Test Case No.7 in Table 3

2.2.6.1.1 Middle Channel: 3625MHz

x dB E	Bandwidth	19.	.87 MHz	x dB		-26.00	dB		
	mit Freq Erro	r 10.4	174 kHz	OBW Po	wer	99.00			
		17.852	MHz						
Occu	pied Bandw	ridth		Total Po	wer	-15.93 d	Bm		
	.625 GHz 200 kHz			#VBV	N 620 kH	z			pan 40 M Weep 1
8									
6									
6 mm	mannahlar	UH LANA	-	_			мL	mannan	marra
-							mi		
6		n					1		
.6		prv	manstran	and and a contraction of the con	Low Jaffal Analoused	man	my		-
6									
dB/div	Ref -17.56	dBm							
		#	IFGain:Low	#Atten: 6 dB				Radio Dev	ice: BTS
rker 1	3.6325 GHz	Input: RF		Center Freq Trig: Free R #Atten: 6 dB	un	Avg Hold:	200/200	Radio Std: Radio Dev	
RL	50 Q		AC	SENSE:INT		IGNAUTO			16 PMNov 17



2.2.6.2 OBW – Test Case No.21 in Table 3:

Agilent Spectrum Analyzer - Occupio RL 50 Ω	AC	SENSE:INT	ALIGNAUTO	04:36:05 PMNov 18,2
urker 1 3.6869 GHz	#IFGain:Low	Center Freq: 3.69250 Trig: Free Run #Atten: 6 dB	0000 GHz Avg Held: 200/200	Radio Std: None Radio Device: BTS
g				
2				
2	- Antoning	son have many anormal	mannon	
2				
2			¥	
2 14	N ¹			A 10-10
2 marmalinalina	n M		1.m	m Horth Martham
2				
2				
9				
nter 3.693 GHz es BW 150 kHz		#VBW 470	kHz	Span 30 M Sweep 1.333
Occupied Bandwid		Total Power	-18.55 dBm	
1	3.413 MHz			
Transmit Freg Error	5.821 kHz	OBW Power	99.00 %	
x dB Bandwidth	14.27 MHz	x dB	-26.00 dB	
			20100 42	
			STATUS	

2.2.6.2.1 Bottom Channel: 3692.5MHz



2.2.6.3 OBW – Test Case No.35 in Table 3:

RL 50 Q	AC	SENSE:INT Center Freq: 3.555000	ALIGNAUTO	06:02:39 PMNov 25, 20 Radio Std: None
arker 1 3.5550 GHz	#IFGain:Low	→ Trig: Free Run #Atten: 6 dB	Avg Hold: 200/200	Radio Device: BTS
g	<u> </u>			
28	muniman	mar har har har har har har har har har h	valant man	
38	(
8	1		h	
8	A		- Kho	
8 minun minun Minu	nd			Marlmarlander and a
I I I				h Harmannangan
8				
8				
3				
enter 3.555 GHz les BW 100 kHz		#VBW 300 k	Hz	Span 20 Mi Sweep 1.933 r
Occupied Bandwidtl	ո 9383 MHz	Total Power	-15.64 dBm	
Transmit Freq Error	7.140 kHz	OBW Power	99.00 %	
x dB Bandwidth	9.676 MHz	x dB	-26.00 dB	

2.2.6.3.1 Bottom Channel: 3555MHz



2.2.6.3.2 High Channel: 3695MHz

RL	rum Analyzer - Occupied 50 Ω		AC S	ENSE:INT		IGNAUTO			6 PMNov 26,
rker 1	3.6952 GHz	ıt: RF #IFGain	n:Low			0 GHz Avg Hold: 200	0/200	Radio Std: N Radio Devic	
	Rei -18.01 dB	<u> </u>							
ō			-0		ο . Δ.				
5		partison	was hours	and the second	mannin	arhanned	2		
6							-		
5							- 2		
6		pr-					had	A.A. +	
and and	month and							hum	man
;									
;									
nter 3.6 es BW /	95 GHz 100 kHz			#VE	BW 300 kH2	z			an 20 N 0 1.933
Эссирі	ied Bandwidt 8.	^h 9415 M	Hz	Total P	ower	-17.61 dBr	n		
Fransm	it Freq Error	4.774	kHz	OBW P	ower	99.00	%		
	ndwidth	9.585 [x dB		-26.00 d			



2.2.6.4 OBW – Test Case No.49 in Table 3:

	nit Freq Error andwidth	-224 Hz 4.905 MHz	OBW Power x dB	99.00 % -26.00 dB	
		4723 MHz	Total Power	-14.84 dBm	
	698 GHz 51 kHz		#VBW 160		Span 10 M Sweep 3.667
7					
5					
sound	mannon				www.www.
5	and	Wend of a			Wind at a
5				<u> </u>	
5					
5		warden warden war	- walk the way and a stranger was	man man man	
5					
dB/div	Ref -16.5 dBm	n			
		it: RF ↔ #IFGain:Low	 Trig: Free Run #Atten: 6 dB 	Avg[Hold: 200/200	Radio Device: BTS
rker 1	50 Ω 3.6978 GHz	AC	SENSE:INT Center Freq: 3.69750		01:59:11 PMNov 29, Radio Std: None

2.2.6.4.1 High Channel: 3697.5MHz



2.3 BAND EDGE

2.3.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 96, Clause 96.41 (e)(3)

2.3.2 Date of Test and Modification State

17 November, 2021- Modification State 0 18 November, 2021- Modification State 0 25 November, 2021- Modification State 0 29 November, 2021- 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°CRelative Humidity15%

2.3.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01. The EUT was connected to a Spectrum Analyser via an attenuator and switching box. The path loss between the EUT and the Spectrum Analyser was measured using a Network Analyser. The measured path loss was entered as a Reference Level Offset in the Spectrum Analyser. The Spectrum Analyser RBW was adjusted to be at least 1% of the measured 26dB Bandwidth. Using an RMS detector, the frequency spectrum up to 1MHz away from the Band Edge was investigated.

The worst-case scenarios are given in Table 7: 20MHz OBW (test case No.7 & No.14); for 15MHz OBW (test case No.21 & 28); for 10MHz OBW (test case No.35 & 42) and for 5MHz OBW (test case No. 49 & 56).



2.3.6 Test Results

Maximum Output Power 19 dBm

2.3.6.1 Test case No. 6 in Table 3

			Bottom Channe	I: 3560MI	Ηz ·	– QP	SKI	Mod	ulatior	n – BW:20M	ЛНz	
			nalyzer - Swept SA									
RL		50 Q	62917536 GHz	AC SI	ENSE:I	NT		ALI	GNAUTO	pe: Pwr(RMS)		1 PM Nov 17, 2 RACE 1 2 3 4
	eq	3.3	Input: RF P	NO: Fast +++ Gain:High		g: Free F ten: 0 di			Arg Iy	pe. r wi(ruis)		DET A N N N
dB/div			Offset 42.56 dB 22.56 dBm								Mkr1 3.52 Power -58	
2.6												
56												
14	+	+										1- yet 3.00
.4	+	+										1
.4	+	+										+
.4	+	+										1
.4	+	+								put for a construction of	Mary approximately and	
.4			1	nontrananana	-			en la				
4		\$	and the second of the second she was a second she was a second of the second seco									
art 3.5											Stop 3.	56292 G
tes BV	_	_		#VBV	V						veep 5.00	s (1001 p
R MODE	_	f	× 3.529 95 GHz	-67.68 d	Bm	Rund R			ION WIDTH	F	UNCTION VALUE	-58.49 dE
2 N		f	3.529 50 GHz	-68.20 d					000 MHz			-48.29 di
	+	-			-							
i												
; ,	-	-						-				
3	-	_			_							
2	-	-										
3	_	_					_		STATUS			
1									araros			



		тор	Channel	. 309(- QF3		ouui	auon -	- DVV	.2011	72		
	ctrum A	nalyzer - Swe	pt SA										(
and Spa	50 Ω an 1(00.00000	Input: RF	AC PNO: Fas IFGain:Hig	at	E:INT Trig: Free #Atten: 0 d		AL	IGN AUTO Avg Ty	pe: Pwr(RMS)	01:2		
10 dB/div)ffset 42.56 22.56 dBi								E		kr1 3.72 Power -		
12.6														
2.56														
7.44														
	and the state	ground at more	- Charles and					_						-13.00
27.4														
37.4														
47.4			1	X										
57.4				man	Mummun	An								1.2
57.4					Hummer	an and	- anenad	horner	Manager	environen	man	and the manufactures		
tart 3.69 Res BW					#VBW						#Sv	Stop veep 5.0	3.722 0 s (10	
KR MODE TR			×		Y				TION WIDTH		F	UNCTION VALUE		
1 N 1 2 N 1	f		3.720 050 GHz 3.720 500 GHz		67.86 dB		Power Power		00.0 kHz 000 MHz					47 dE
3							1 0/10/							20 42
5				-		-								
6						_								
8				-		-								
						-								
0														
9 0 1 2				+		_								

Top Channel: 3690MHz – QPSK Modulation – BW:20MHz



			Bottom Channel	: 3557.5MH	z – QPSK	Modulatio	n – BW:15	MHz
	Spect		nalyzer - Swept SA					
RL tart F	req	50 Ω 3.			rig: Free Run Atten: 0 dB	ALIGNAUTO Avg Ty	pe: Pwr(RMS)	01:09:37 PMNov 18, 2 TRACE 1 2 3 4 TYPE WWWWW DET A N N N
) dB/di	v		Dffset 42.56 dB 22.56 dBm					kr1 3.529 950 GI Power -58.75 dB
2.6								
.56								
44								12.00
.4							p p	antine washing and a star
.4	-							
.4							1	
.4	-							
.4		11-				and and a star and a star and a	CALLAR DATE	
7.4	L\$	Q ¹		and a superior	Kgrafilmatetinkalistationiky			
art 3. Res B				#VBW	-		#Sv	Stop 3.55750 G veep 5.00 s (1001 p
R MODE			X	Y		FUNCTION WIDTH	F	UNCTION VALUE
1 N 2 N	1	f	3.529 950 GHz 3.529 500 GHz		Band Power Band Power	100.0 kHz 1.000 MHz		-58.75 de -48.30 de
1								
5								
5								
3								
)								
2								
-	-	-						

2.3.6.2 Test case No. 16 in Table 3



Aglient Spectrum Analyzer - Swept SA RL 50 Ω AC SENSE:INT ALIGNAUTO 01:27:12 PMNov and Span 100.000000 kHz Input: RF PN0: Fast IFGain:High Ref Offset 42.56 dB dB/div Ref 22.56 dBm Gamma Sent Sent Sent Sent Sent Sent Sent Sent
And Span 100.000000 kHz Input: RF PN0: Fast IFGain:High Trig: Free Run #Atten: 0 dB Ref Offset 42.56 dB dB/div Ref 22,56 dBm Mkr1 3.720 050 Band Power -57.47 d
Input: RF PN0: Fast IFGain:High Trig: Free Run #Atten: 0 dB Mkr1 3.720 050 Band Power -57.47 (d)
B/div Ref 22.56 dBm Band Power -57.47 d
Minimum and a compared an
and and a second a
rt 3.69000 GHz Stop 3.72200
#Sweep 5.00 s (100 #Sweep 5.00 s (100
MODE TRC X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE N 1 f 3.720 050 GHz -67.86 dBm Band Power 100.0 kHz -57.47
N 1 f 3.720 500 GHz -57.85 dBm Band Power 1.000 HHz -77.29
STATUS

Top Channel: 3692.5MHz – QPSK Modulation – BW:15MHz



2.3.6.3 Test case No. 35 in Table 3

		Bottom Ch	annel: 3555	MHz QP	SK Mo	dulation	– BW:10N	IHz	
	pectrum	Analyzer - Swept SA							
Marker	50 s 1 3.5	2 29500000000 G Input: RF	AC HZ PNO: Fast ↔ IFGain:High	SENSE:INT Trig: Free #Atten: 0 c		ALIGNAUTO Avg Ty	pe: Pwr(RMS)		3:54 PMNov 25, 2021 TRACE 1 2 3 4 5 6 TYPE WWWWWWWW DET A N N N N 1
10 dB/div Log		Offset 42.56 dB f 22.56 dBm							9 500 GHz 47.86 dBm
12.6						_	_		_
2.56									
-7.44									-13.00 dBr
-17.4						_			
-27.4								1/	-
-37.4								1	
-47.4									
-57.4									
-67.4									
Start 3.5 #Res BV			#VE	3W			#S1		3.55500 GHz 0 s (1001 pts
MKR MODE	TRC SCL	×	Y	FUN	CTION FU	INCTION WIDTH		UNCTION VALUE	
1 N 2	1 f	3.529 500	GHz -57.66	dBm Band	Power	1.000 MHz			-47,86 dBm
3									
4 5									
6	_								
8	_								
10									
11 12									

Bottom Channel: 3555MHz QPSK Modulation – BW:10MHz



	Top Channel:	3695IVIHZ -	QPSK M	odulation -	- BAA: LOIME	ΠZ	
Agilent Spectru	m Analyzer - Swept SA						
			ig: Free Run tten: 0 dB	ALIGNAUTO Avg Ty	pe: Pwr(RMS)	TRA	MNov 25, 202 CE 1 2 3 4 5 PE WWWWWW ET A N N N N
	ef Offset 42.56 dB ef 22.56 dBm				M Band I	kr1 3.720 { Power -47.	500 GH 14 dBn
12.6							
2.56							_
7.44							13.00 dB
17.4							10.00 42
27.4							
37.4							_
47.4							♦ ¹
57.4							¥
67.4							
Start 3.6950 Res BW 10		#VBW			#Sv	Stop 3.7 veep 5.00 s	2262 GH (1001 pt
KR MODE TRC S		Y		FUNCTION WIDTH	F	UNCTION VALUE	
1 N 1	f 3.720 500 GHz	-56.88 dBm	Band Power	1.000 MHz			47.14 dBr
3							
5							
6 7							
8							
10							
11							
<u>~ </u>	-						

Top Channel: 3695MHz – QPSK Modulation – BW:10MHz



2.3.6.4 Test case No. 48 in Table 3

Anilant Eng	etrum An	Bottom	h Channe	l: 3552	5MH	z – G	PSK	(Мо	dulatio	on – BW:	5MHz	FF
RL	50 Q	alyzer - Swep	1 JA	AC	SENSE;	INT		ALI	GNAUTO		1	01:37:48 PMNov 29,
top Fre	q 3.5	5455191	nput: RF F	PNO: Fast Gain:High		ig: Free tten: 0 d			Avg Ty	pe: Pwr(RMS)		TYPE WWWWW DET A N N N
) dB/div		ffset 42.56 d 22.56 dBn								Ban	Mkr1 3. d Powe	529 500 G r -48.27 dE
pg												
2.6												
56												1
44					-						_	-13.00
.4												
.4											1	_
4					-							
4		5							/			
4												
.4												
art 3.52 tes BW				#V	'BW					#	Sweep 5	op 3.55455 G i.00 s (1001 p
R MODE T			×	Y			CTION	FUNCT	ION WIDTH		FUNCTION V	ALUE
N 1	f	3	529 500 GHz	-58.0	01 dBm	Band	Power	1.0	00 MHz			-48.27 di
					_							
	+											
				_								



		Top Channel: 3		- QPSKI	viouulation		ПΖ		
		zer - Swept SA							
arker 1	^{50 Ω} 3.7205			g: Free Run tten: 0 dB	ALIGNAUTO Avg Ty	pe: Pwr(RMS)	09:	TRACE 1 2 TYPE WWW DET A N	345
dB/div	Ref Offse Ref 22.	et 42.56 dB 56 dBm				Mk Band	r1 3.720 Power	500 0 (-47.49 c	GF JB
2.6									
56									
14	}								
4								-13	3.00
4									
4	1	_							
4									
4							5	1	H
4									
	750 GHz 100 kHz		#VBW			#S1	Stop weep 5.0	o 3.72100 10 s (1001	G 1 p
MODE TR		×	Y		FUNCTION WIDTH		FUNCTION VALU		
N 1	f	3.720 500 0 GHz	-57.49 dBm	Band Power	1.000 MHz			-47.49	dE
									_
									_
2									
					STATUS				

Top Channel: 3697.5MHz – QPSK Modulation – BW:5MHz



2.4 TRANSMITTER SPURIOUS EMISSIONS

2.4.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1051 FCC CFR 47 Part 96, Clause 96.41 (e)(1)

2.4.2 Date of Test and Modification State

17 November 2021 - Modification State 0 18 November 2021 - Modification State 0

2.4.3 Test Equipment Used

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

2.4.4 Environmental Conditions

Ambient Temperature23°CRelative Humidity35%

2.4.5 Test Method

All measurements were made in accordance with FCC KDB 971168 D01. The EUT was connected to a Spectrum Analyser via an attenuator and switching box. Prior to testing, a Network Analyser was used to calibrate the path loss between the EUT and the Spectrum Analyser. The worst-case path loss in the measured ranges was entered as a reference level offset. Over the measured ranges, the RBW was set to 1MHz with a VBW of 3MHz. All measurement results are specified as average with an RMS detector being used in conjunction with a trace setting of Max Hold. Measurements were performed in configurations of the EUT as reported below.

Testing was performed with a test limit of -40 dBm/MHz (for emissions < 3530 MHz and > 3720 MHz).

Testing was performed on this port with a test limit of -25 dBm/MHz (for emissions within 10 MHz of the carrier).

The worst-case test cases were: No.1; 3;5;7;9;11 and 13.



2.4.6 Test Results

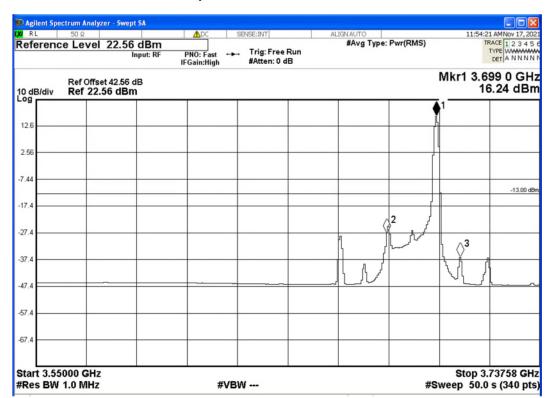
Maximum Output Power 18 dBm

Range Frequency (MHz)	Limit (dBm)	Result
0.009 to 3530	-40	Pass <note 1=""></note>
3530 to 3650	-25	Pass
3650 to 3660	-13	Pass
3700 to 3710	-13	Pass
3710 to 3720	-25	Pass
3720 to 40000	-40	Pass <note 2=""></note>
Note 1. The device was scanned from 9kH: less than 6Bd from the limit) was fou Note 2. The device was scanned up to 40G 6Bd from the limit) was found	Ind	, a

2.4.6.1 Worst-Case test No. 1 – Top Channel: 3690MHz

rkor	1 1	50Ω 271	6480675	516 GHz	Acc	SENSE:I	VT]	ALIGNAUTO		Pwr(RMS)		0 AMNov 17,
Kei	4 .	5.71		Input: RF P	NO: Fast Gain:High	Tri	g: Free Run ten: 0 dB		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	, mérano)		DET A N N N
B/div) ffset 42.56 22.56 dBr								Mkr4 3.7 -3	16 5 G 1.36 dE
										\Y1		
										ſ		
										ſ		
_											A3	-13.00
									. 2		. 8	
									$\langle \rangle^2$			
	_					_		~~	ſ` <u>`</u>	R	1	1
		00 G									Stop 3.	72000 G
s Bl	W 1	.0 M	Hz		#\	/BW				#S	weep 5.00	s (340 j
MODE N	TRC 1			× 3.681 4 GHz	Y	20 dBm	FUNCTION	FUNCTION WID1	H	FL	INCTION VALUE	
N	1	f		3.661 8 GHz	-36.	54 dBm						
NN	1	f		3.698 9 GHz 3.716 5 GHz		60 dBm 36 dBm			+			
		-		0.11000112		oo abiii						
								1				





2.4.6.2 Worst-Case test No. 3 – Top Channel: 3690MHz

2.4.6.3 Wost-Case test No. 5 – Top Channel: 3690MHz

RL		50 Q				<u>∧</u> DC	SENSE:1	NT			AUTO			01:1	2:07 PMNov 17, 2
arke	er 2	3.68	33485			'NO: Fast + Gain:High		g: Free F ten: 0 d			#Avg Ty	/pe: Pwi	r(RMS)		TRACE 1 2 3 4 TYPE WWWWW DET A N N N
dB/	div		Offset 4 22.56	2.56 dB dBm											.683 5 GI 26.12 dB
2.6															
56 -							_							1	
44		_					_					_	_		-13.00
4				-			+			_		_	2	^3	-13.00
4							-					-	y	¥.	-
4		-					-		-			J.			
4				-			+					-		-	
.4							+								-
.4 -							-	-							+
	3.55 BW					#V	'BW						#S	Stop weep 50	3.73029 G .0 s (340 p
R MO	IDE TR	C SCL		×		Y		FUNC	TION	FUNCTION	N WIDTH		F	UNCTION VALUE	
		f			.689 9 GHz .683 5 GHz		18 dBm 12 dBm								
3 N		f			697 3 GHz		21 dBm								
5															
5	+	+													
B 9															
	-	+													
0	_														



RL		50 Q			ADC SENS	E:INT	ALIGNAUTO		03:16:56 PM Nov 17, 20
isplay	y Li	ne	-13.00 dB	Input: RF PI		Trig: Free Run Atten: 0 dB	#Avg Ty	ype: Pwr(RMS)	TRACE 1 2 3 4 TYPE WWWWWW DET A N N N
) dB/di			Offset 42.56 (17.93 dBn					Г	4 14 17 18 18 18 18 18 18 18 18 18 18 18 18 18
og 7.93									
.07								Jan King	~
2.1									-13.00
2.1							2.15	_	
2.1		_						$\langle \rangle^2$	♦3
2.1									
21									
2.1									
2.1									
L									
tart 3. Res B					#VBW ·			#Sv	Stop 3.72948 Gl veep 50.0 s (340 p
KR MODE	TRC	SCL		x	Y	FUNCTION	FUNCTION WIDTH	FUN	ICTION VALUE
1 N 2 N	1	f		3.689 4 GHz 3.678 7 GHz	3.57 dB -33.09 dBr				
3 N	1	f		3.700 9 GHz	-33.03 dBi	n			
	+						+		
5									
5 6 7 8									
4 5 6 7 8 9									
5 6 7 8									

2.4.6.4 Wost-Case test No. 7 - Top Channel : 3690MHz

2.4.6.5 Wost-Case test No. 9: Bottom Channel - 3560MHz

3.549217 Ref Offset				#Ava Tva	e: Pwr(RMS)	TRACE 1 2 3
Ref Offset		ain:High #At	g: Free Run ten: 0 dB		e. r wr(KMS)	TYPE WWWW DET A N N I
Ref 22.5						Mkr2 3.549 2 G -25.22 dE
¥1						
4						
						-13.00
1.	∂ ³					
r/	L 1					
-						
		#1/DW				Stop 3.72000 G
		#VBW				weep 60.0 s (340 p
		'	FUNCTION	FUNCTION WIDTH	FU	NCTION VALUE
f	3.549 2 GHz	-25.22 dBm				
f	3.559 8 GHz	-28.53 dBm				
	142 GHz 1.0 MHz	2 3 142 GHz 1.0 MHz 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	142 GHz 142 GHz 1.0 MHz #VBW 5 Still X f 3.5510 GHz 1.111 dBm f 3.5549 2 GHz -25 22 dBm	2 3 142 GHz #VBW 142 GHz #VBW 5 551 0 GHz 14.11 dBm f 3.551 0 GHz -25.22 dBm	2 3 42 3 142 GHz 1.0 MHz #VBW E SEL 7 3.551 0 GHz 14.11 dBm 1 1 3.549 2 GHz -252 2 dBm	2 3 2 3 142 GHz #VBW 10 MHz #VBW #VBW #St 5 SEL 1 3.551 0 GHz 14.11 dBm f 3.549 2 GHz



RL arker	-	50 ຊ .691	41592	9204 GHz	<u>_</u> DC	SENSE:I			ALIGNAUTO #Avg 1	ype: Pwr(R)	MS)		145 PM Nov 17, 2 TRACE 1 2 3 4
				Input: RF	PNO: Fast Gain:High		g:FreeRu ten:0dB	n					DET A N N N
dB/div			set 42.56 2.56 dE								I	0 Mkr3 3.0 -2	691 4 GI 23.98 dB
2.6	_			_			_					<u>_1</u>	
56		-									A	<u>~</u>	-
14										_		3	-13.00
.4		-									2	-•*	
4											Y	-	
4								_					
4		_											
.4		+				_							
art 3.													3.72000 G
les Bl			z		#	VBW							0 s (340 p
R MODE		f		× 3.686 9 GHz		5.42 dBm	FUNCTI	ON	FUNCTION WIDTH		FU	NCTION VALUE	
N	1	f		3.679 4 GHz	-3'	1.35 dBm							
N	1	f		3.691 4 GHz	-23	3.98 dBm		_					
	-	_						_					
	+												
	+	-											

2.4.6.6 Wost-Case test No. 11: Bottom Channel - 3560MHz

2.4.6.7 Wost-Case test No. 13 - Top Channel : 3590MHz

RL		50 Ω			<u>∧</u> DC	SENSE:1	NT	AL	IGN AUTO			16 AMNov 18, 2
larkei	12	3.68	89364		PNO: Fast Gain:High	→ Tri #At	g: Free Run ten: 0 dB		#Avg T	ype: Pwr(RMS)		TYPE WWWWW DET A N N N
0 dB/di			offset 42 22.56 c								Mkr2 3.0 -2	688 9 GI 1.71 dB
2.6											1	
.56										2	· ·	
44											ſ	
		_				_				2	3	-13.00
.4											V	
7.4												
7.4	_					-					1	
7.4	~~~	_				_	<u></u>					-
7.4						-						
7.4												
tart 3	550	00.0	147								Stop 3	3.72944 G
Res B					#	VBW				#S1	weep 60.	
R MODE	TRC	SCL		×		Y	FUNCTION	FUNC	TION WIDTH	FU	NCTION VALUE	
1 N 2 N	1	f		3.692 9 GHz 3.688 9 GHz		1.88 dBm .71 dBm		-				
3 N	1	f		3.700 3 GHz		.70 dBm		-				
4												
5		-						+				
7												
8 9								-				
	-	-										
0												



2.5 FREQUENCY STABILITY

2.5.1 Specification Reference

FCC CFR 47 Part 2, Clause 2.1055 FCC CFR 47 Part 96, Clause 27.54

2.5.2 Date of Test and Modification State

29 November 2021 - 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 Temperature22°CRelative Humidity30%

2.5.5 Test Method

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

2.5.6 Test Results

Worst Case Scenario

Maximum Output Power 18dBm

Table 10 – Worst Case of Frequenc	v Ctobility Magguran	ant (Test Cose No. 2 in Table 2)
Table TU – Worst Case of Frequenc	v Slapililv Measurenn	eni (Tesi Case No. 2 in Table 3)

Temperature	Voltage (AC)	Frequency Error (Hz)	Limit ppm <note 2=""></note>	Error/Freq ppm	Result
-30°C	115	Note 1	±1.5	0.0012	Pass
-20°C	115	87.24	±1.5	0.0010	Pass
-10°C	115	34.21	±1.5	0.0004	Pass
0°C	115	31.0	±1.5	0.0003	Pass
+10°C	115	20.50	±1.5	0.0002	Pass
+20°C	115	22.7	±1.5	0.0003	Pass
+20°C	90	21.22	±1.5	0.0002	Pass
+20°C	132	13.17	±1.5	0.0001	Pass
+30°C	115	16.34	±1.5	0.0002	Pass
+40°C	115	18.30	±1.5	0.0002	Pass
+55°C	115	4.62	±1.5	0.00005	Pass
The frequency states the authorized back			sure that the funda	mental emissions	stay within



2.6 RADIATED EMISSION

2.6.1 Specification Reference

FCC CFR 47 Part §2.1051 FCC CFR 47 Part 96.41

2.6.2 Date of Test and Modification State

22 November 2021 – Modification State 0 23 November 2021 – Modification State 0 23 February 2022 – 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 Temperature23.1°CRelative Humidity13.4%

2.6.5 Test Method

All measurements were made in accordance with:

- 971168 D01 Power Meas License Digital Systems v03r01 Clause 5.6
- 971168 D01 Power Meas License Digital Systems v03r01 Clause 7

Measurements were performed in configurations of the EUT as reported below. Testing was performed with RF on with a test limit of FCC 15 Subpart B Class A at 3m.

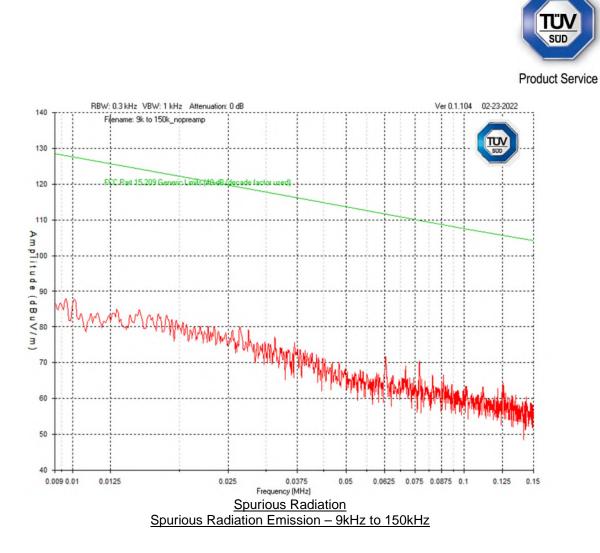


2.6.6 Test Results

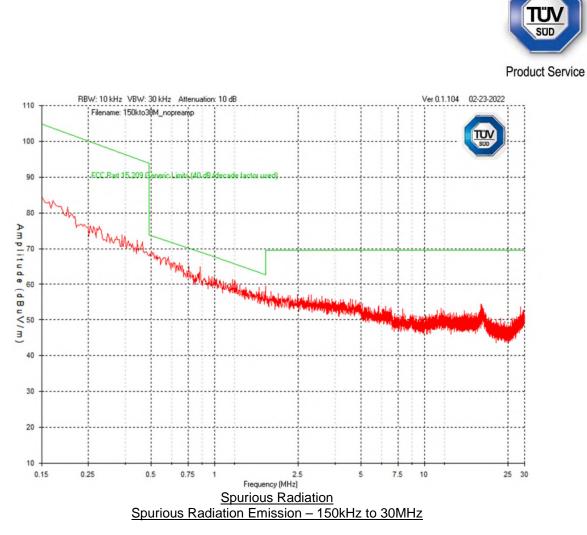
A summary of the test result is depicted in the table below.

Range Frequency (MHz)	Limit <note 1=""> dBµV/m</note>	Result
0.009 to 0.150	40dB/decade	Pass
0.15 to 30	40dB/decade	Pass
30 to 1000	49.5	Pass
1000 to 4000	59.96	Pass
4000 to 10 000	59.96	Pass
10 000 to 18 000	59.96	Pass
18 000 to 26 500	69.54	Pass
26 500 to 40 000	69.54	Pass
Note 1. Only the most restringing det	tector level (or limit in the range)	is provided

Table 11 – Radiated Emission Measurement	(Test Cess Ne 7 in Teble 0)
Table TT - Radiated Emission Measurement	(Test Case No. 7 In Table 3)

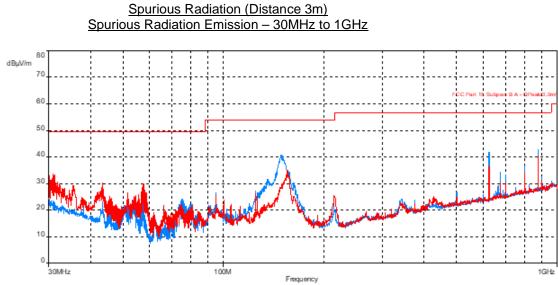


Note: No significant emission (i.e., less than 10dB below the limit) was noted.



Note: No significant emission was noted.

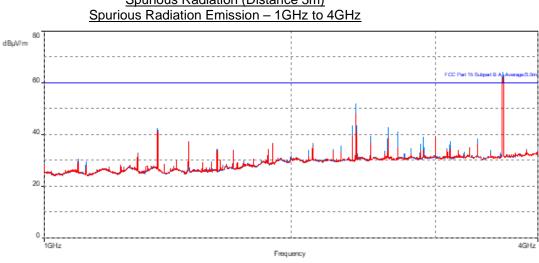




r inga na y

QuasiPeak (7)									
Frequency	SR	Level	Limit	Margin	Height (m)	Azimuth	Polarizatio	Correction	
(MHz)		(dBµV/	(dBµV/m)	(dB)	(dB)	(°) (dB)	n (dB)	(dB)	
		m)							
30.85368556	1	32.80	49.54	-16.74	1.17	356.75	Vertical	-3.24	
148.6364905	2	39.28	54.08	-14.80	1.00	0.00	Horizontal	-9.67	
155.9527531	1	34.02	54.08	-20.06	1.00	203.75	Vertical	-10.03	
625.0231185	2	40.88	56.80	-15.92	1.00	127.25	Horizontal	-0.47	
625.0229582	1	36.88	56.80	-19.92	3.73	228.00	Vertical	-0.47	
875.032311	2	40.73	56.80	-16.07	1.87	335.75	Horizontal	4.03	
875.032311	1	40.86	56.80	-15.94	1.00	41.00	Vertical	4.03	





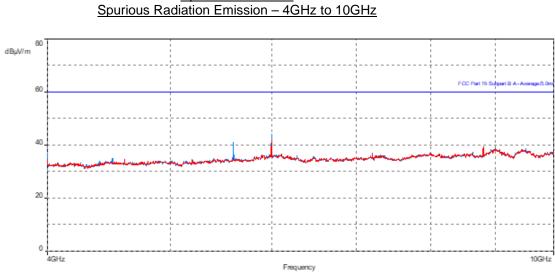
Spurious Radiation (Distance 3m)

Red=Vertical, Blue=Horizontal

Finals

AVG (6)										
Frequency	S	Level	Limit	Margin	Height (m)	Azimuth	Polarizatio	Correction		
(MHz)	R	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(°) (dB)	n (dB)	(dB)		
1375.050321	2	42.02	59.96	-17.94	2.14	41.00	Horizontal	-9.34		
1375.051282	1	39.93	59.96	-20.03	3.00	362.00	Vertical	-9.34		
2400.088782	2	50.69	59.96	-9.27	2.01	312.00	Horizontal	-4.96		
2400.087821	1	46.84	59.96	-13.12	1.04	218.25	Vertical	-4.96		
3624.38141	1	53.40	59.96	-6.56	1.46	341.00	Vertical	-3.71		
3624.994231	2	53.23	59.96	-6.73	1.00	31.25	Horizontal	-3.71		





Spurious Radiation Spurious Radiation Emission – 4GHz to 10GHz

Red=Vertical, Blue=Horizontal

Finals

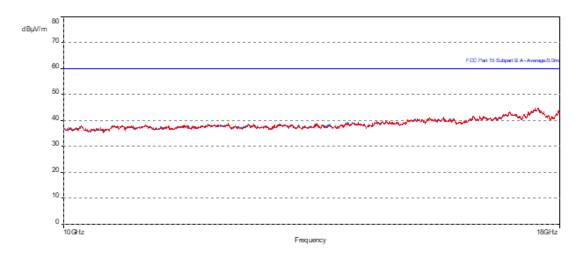
AVG (3)										
Frequence	:y	S	Level	Limit	Margin	Height (m)	Azimuth	Polarizatio	Correction	
(MHz)	-	R	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(°) (dB)	n (dB)	(dB)	
5600.2096	515	2	37.29	59.96	-22.67	2.21	23.75	Horizontal	0.74	
6000.2237	/18	2	43.77	59.96	-16.19	3.55	55.25	Horizontal	2.81	
6000.2240	38	1	39.82	59.96	-20.14	2.21	11.00	Vertical	2.81	



Spurious Radiation Spurious Radiation Emission – 10GHz to 18GHz

"TÜV SÜD, by release of this raw data, does not imply that the tested product has demonstrated compliance to any standard. The raw data provided may not be complete and may require additional processing. If raw data provided includes engineering data, testing may not have been done according to a standard test method. "

Emi CC test:C4 10-18 GHz 3m Number :125 Execution date: 11/23/2021 9:38:44 AM								
Limit	FCC Part 15 Subpart B							
Class	Class: A							
Test Plan Number	7169010408							
Configuration Information	Test Case No.7							
Results	Pass							
Model	Nokia 7705 SAR-Hmc NA(3HE12472AA)							
Tested by	CR							
Comments	-							

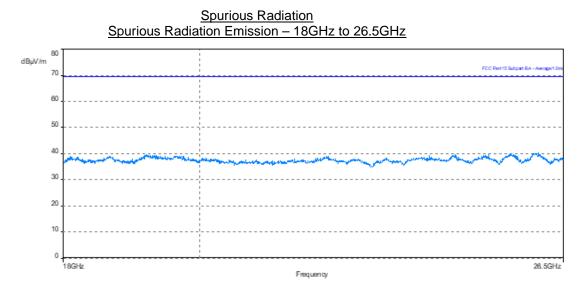


Red=Vertical, Blue=Horizontal

Finals

AVG (2)										
Frequency	S	Level	Limit	Margin	Height (m)	Azimuth	Polarizatio	Correction		
(MHz)	R	(dBµV/m)	(dBµV/m)	(dB)	(dB)	(°) (dB)	n (dB)	(dB)		
17473.75803	2	40.53	59.96	-19.43	4.00	24.75	Horizontal	16.79		
17542.97627	1	41.12	59.96	-18.84	4.00	16.50	Vertical	16.72		



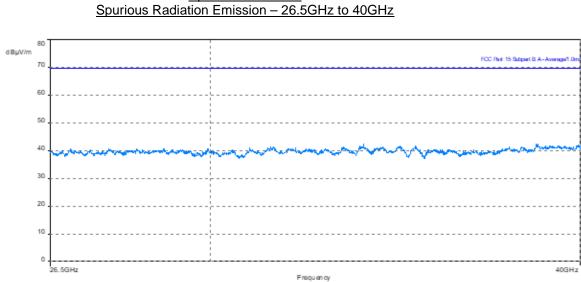


Red=Vertical, Blue=Horizontal

<u>Finals</u>

Meas. Avg (1)										
Frequency	SR	Meas.Avg	Limit	Meas Lim.	Polarization /	Correction (dB)				
(MHz)		(dBµV/m)	(dBµV/m)	(dB)	Comments					
25009.66668	1	36.17	69.54	-33.37	Horizontal /	-13.34				
			Meas. peal	k (1)						
Frequency	SR	Meas.Peak	Limit	Meas Lim.	Polarization /	Correction (dB)				
(MHz)		(dBµV/m)	(dBµV/m)	(dB)	Comments					
25009.66668	1	49.46	89.50	-40.04	Horizontal /	-13.34				





Spurious Radiation

Red=Vertical, Blue=Horizontal

<u>Finals</u>

Meas. Avg (1)										
Frequency	SR	Meas.Avg	Limit	Meas Lim.	Polarization /	Correction (dB)				
(MHz)		(dBµV/m)	(dBµV/m)	(dB)	Comments					
33794.51218	1	39.19	69.54	-30.35	Horizontal /	-12.93				
Meas. peak (1)										
Frequency	SR	Meas.Peak	Limit	Meas Lim.	Polarization /	Correction (dB)				
(MHz)		(dBµV/m)	(dBµV/m)	(dB)	Comments					
33794.51218	1	52.58	89.50	-36.92	Horizontal /	-12.93				



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

Instrument	Manufacturer	Type No.	Serial No.	Calibration Date	Calibration Due					
Bilog Antenna	TESEQ	CBL 6111D	SSG013965	2021-05-04	2022-05-04					
Horn Antenna 3MCH 00003	ETS	3117	LAVE04211	2021-03-30	2022-03-30					
EMI Receiver	Rohde & Schwarz	ESU26	SSG013729	2021-03-31	2022-03-31					
Spectrum analyzer	Rohde & Schwarz	ESU-40	LAVE04092	2020-07-17	2022-07-17					
Coaxial Cable	Huber & Suhner	106A	SSG012455	2021-01-05	2023-01-05					
Coaxial Cable	Huber & Suhner	106A	SSG012711	2021-01-05	2023-01-05					
Coaxial Cable	Huber & Suhner	104PEA	SSG012041	2021-01-05	2023-01-05					
Coaxial Cable	Huber & Suhner	ST18/Nm/Nm/36	SSG012785	2021-01-06	2023-01-06					
Coaxial Cable	Micro-Coax	UFA 210B-1- 1500-504504	SSG012376	2021-01-06	2023-01-06					
Pre-Amplifier	Нр	8447D	SSG013045	2021-01-29	2023-01-29					
Pre-Amplifier	BNR	LNA	SSG012594	2021-04-12	2022-04-12					
Pre-Amplifier	BNR	LNA	SSG012360	2020-11-16	2022-11-16					
Power Supply	Hewlett Packard	6216A	SSG013063	not required	not required					
N/A: No applicable O/P Mon – Output monit										

List of absolute measuring and other principal items of test equipment.



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Conducted Maximum Peak Output Power	30 MHz to 20 GHz Amplitude	± 0.1 dB
Conducted Emissions	30 MHz to 20 GHz Amplitude	± 2.3 dB
Frequency Stability	30 MHz to 2 GHz	± 5.0 Hz
Occupied Bandwidth	Up to 20 MHz Bandwidth	± 1.1 Hz
Band Edge	30 MHz to 20 GHz Amplitude	± 2.3 dB



SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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

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