

#### **TEST DESCRIPTION**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The fundamental emission Occupied Bandwidth was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i, and 6.4.

The method in section 5.4 of ANSI C63.26 was used to make this measurement. The spectrum analyzer settings were as follows:

- RBW is 1% 5% of the occupied bandwidth
- VBW is ≥ 3x the RBW
- Peak Detector was used
- Trace max hold was used

The 26dB emission bandwidth is measured in accordance with section 4 of FCC KDB 971168 D01v03r01 and ANSI C63.26 section 5.4. FCC 2.1049 requires an emission bandwidth measurement. FCC 27.53(I)(1) defines the emission bandwidth to be used as 26 dB down.

	FCC 5G Er	nission Designators f	or 3.7G Band (3700N	1Hz to 3980MHz)	
Channel Bandwidth	Radio Channel	5G-NR: QPSK	5G-NR: 16QAM	5G-NR: 64QAM	5G-NR: 256QAM
	Low	19M8G7W			
20MHz	Mid	19M9G7W	19M8G7W	19M8G7W	19M8G7W
	High	19M8G7W			
	Low	40M3G7W			
40MHz	Mid	40M4G7W	40M1G7W	40M3G7W	40M2G7W
	High	40M3G7W			
	Low	60M8G7W			
60MHz	Mid	60M8G7W	60M8G7W	60M9G7W	61M0G7W
	High	60M8G7W			
	Low	81M5G7W			
80MHz	Mid	81M7G7W	81M1G7W	81M6G7W	81M5G7W
	High	81M5G7W			
	Low	102MG7W			
100MHz	Mid	102MG7W	102MG7W	102MG7W	103MG7W
	High	102MG7W			
Note: FCC emiss	ion designators a	re based on 26dB em	iission bandwidth me	asurement data.	

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3239	ANE	2024-02-14	2025-02-14



EUT:	AVQQA Remote Radio Head	Work Order:	NOKI0075
Serial Number:	L1242403137	Date:	2024-08-15
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	David Le, John Rattanavong	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0075-4

#### **TEST SPECIFICATIONS**

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

#### **COMMENTS**

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Band n77 carriers were enabled at maximum power levels for the 3.7 GHz band in the single carrier operating mode configuration.

#### **DEVIATIONS FROM TEST STANDARD**

None

#### CONCLUSION Pass

Tested By

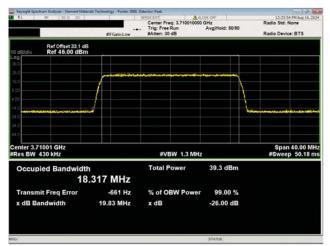
#### **TEST RESULTS**

	Value	Value		
David 4	99% (MHz)	26dB (MHz)	Limit	Result
Port 1 20 MHz Channel Bandwidth QPSK Modulation				
Low Channel, 3710.01 MHz	18.317 MHz	19.833 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	18.323 MHz	19.868 MHz	Within Band	Pass
High Channel, 3969.99 MHz	18.327 MHz	19.821 MHz	Within Band	Pass
16QAM Modulation				
Mid Channel, 3840.00 MHz	18.375 MHz	19.82 MHz	Within Band	Pass
64QAM Modulation				
Mid Channel, 3840.00 MHz	18.321 MHz	19.788 MHz	Within Band	Pass
256QAM Modulation				
Mid Channel, 3840.00 MHz	18.344 MHz	19.794 MHz	Within Band	Pass
40 MHz Channel Bandwidth QPSK Modulation				
Low Channel, 3720.00 MHz	37.892 MHz	40.315 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	37.89 MHz	40.355 MHz	Within Band	Pass
High Channel, 3960.00 MHz	37.913 MHz	40.295 MHz	Within Band	Pass
16QAM Modulation				
Mid Channel, 3840.00 MHz	38.003 MHz	40.147 MHz	Within Band	Pass

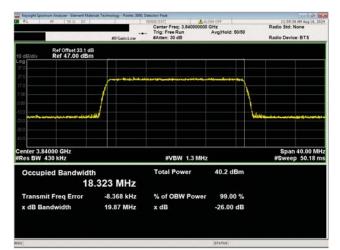


	Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
64QAM Modulation				
Mid Channel, 3840.00 MHz 256QAM Modulation	37.964 MHz	40.306 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	37.911 MHz	40.23 MHz	Within Band	Pass
60 MHz Channel Bandwidth QPSK Modulation				
Low Channel, 3730.02 MHz	57.859 MHz	60.827 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	57.927 MHz	60.815 MHz	Within Band	Pass
High Channel, 3949.98 MHz	57.86 MHz	60.834 MHz	Within Band	Pass
16QAM Modulation				
Mid Channel, 3840.00 MHz 64QAM Modulation	58.02 MHz	60.811 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	57.919 MHz	60.912 MHz	Within Band	Pass
256QAM Modulation				
Mid Channel, 3840.00 MHz	57.9 MHz	61.025 MHz	Within Band	Pass
80 MHz Channel Bandwidth QPSK Modulation				
Low Channel, 3740.01 MHz	77.476 MHz	81.484 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	77.525 MHz	81.693 MHz	Within Band	Pass
High Channel, 3939.99 MHz 16QAM Modulation	77.463 MHz	81.484 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	77.79 MHz	81.084 MHz	Within Band	Pass
64QAM Modulation				
Mid Channel, 3840.00 MHz	77.65 MHz	81.584 MHz	Within Band	Pass
256QAM Modulation				
Mid Channel, 3840.00 MHz	77.575 MHz	81.511 MHz	Within Band	Pass
100 MHz Channel Bandwidth QPSK Modulation				
Low Channel, 3750.00 MHz	97.48 MHz	102.41 MHz	Within Band	Pass
Mid Channel, 3840.00 MHz	97.561 MHz	102.451 MHz	Within Band	Pass
High Channel, 3930.00 MHz	97.437 MHz	102.45 MHz	Within Band	Pass
16QAM Modulation				
Mid Channel, 3840.00 MHz	97.545 MHz	102.334 MHz	Within Band	Pass
64QAM Modulation				
Mid Channel, 3840.00 MHz	97.672 MHz	102.464 MHz	Within Band	Pass
256QAM Modulation				
Mid Channel, 3840.00 MHz	97.635 MHz	102.598 MHz	Within Band	Pass

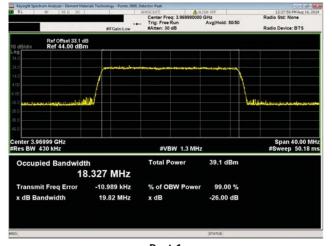




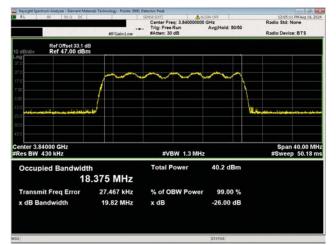
Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3710.01 MHz



Port 1 20 MHz Channel Bandwidth QPSK Modulation Mid Channel, 3840.00 MHz

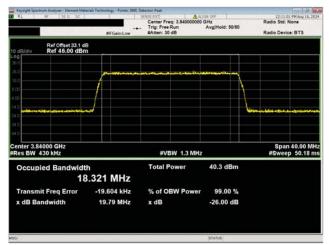


Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3969.99 MHz



Port 1 20 MHz Channel Bandwidth 16QAM Modulation Mid Channel, 3840.00 MHz

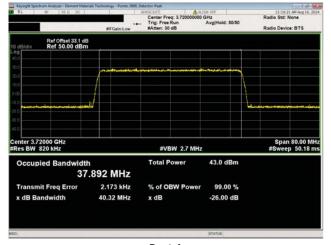




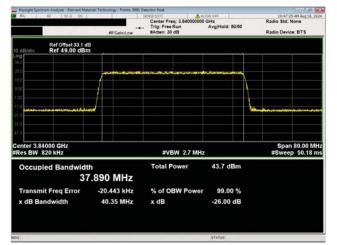
Port 1 20 MHz Channel Bandwidth 64QAM Modulation Mid Channel, 3840.00 MHz



Port 1 20 MHz Channel Bandwidth 256QAM Modulation Mid Channel, 3840.00 MHz

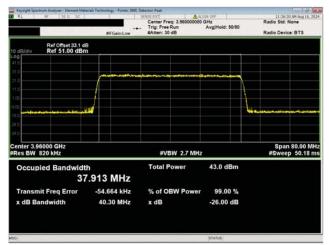


Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz

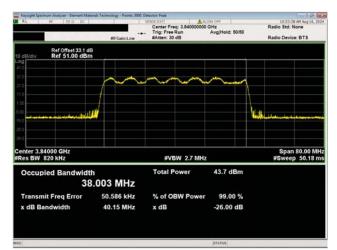


Port 1 40 MHz Channel Bandwidth QPSK Modulation Mid Channel, 3840.00 MHz

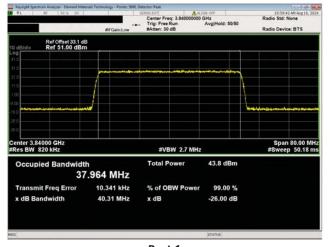




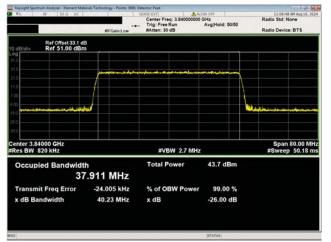
Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz



Port 1 40 MHz Channel Bandwidth 16QAM Modulation Mid Channel, 3840.00 MHz

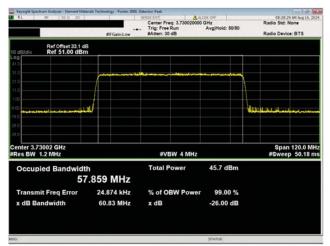


Port 1 40 MHz Channel Bandwidth 64QAM Modulation Mid Channel, 3840.00 MHz



Port 1 40 MHz Channel Bandwidth 256QAM Modulation Mid Channel, 3840.00 MHz

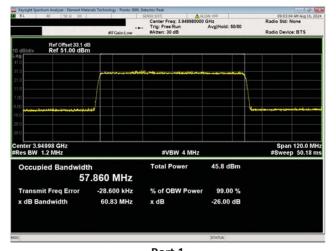




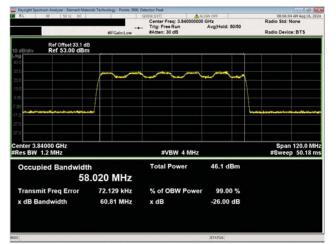
Port 1 60 MHz Channel Bandwidth QPSK Modulation Low Channel, 3730.02 MHz



Port 1 60 MHz Channel Bandwidth QPSK Modulation Mid Channel, 3840.00 MHz

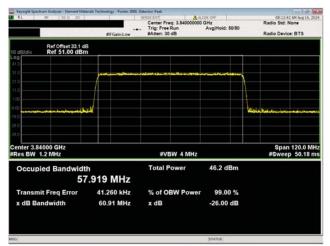


Port 1 60 MHz Channel Bandwidth QPSK Modulation High Channel, 3949.98 MHz

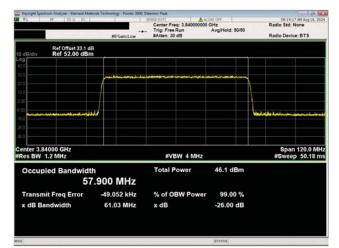


Port 1 60 MHz Channel Bandwidth 16QAM Modulation Mid Channel, 3840.00 MHz

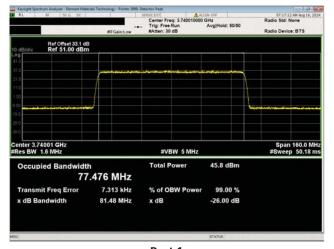




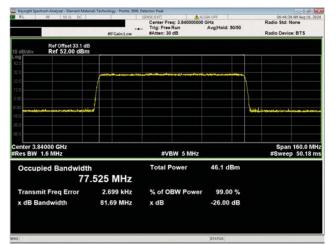
Port 1 60 MHz Channel Bandwidth 64QAM Modulation Mid Channel, 3840.00 MHz



Port 1 60 MHz Channel Bandwidth 256QAM Modulation Mid Channel, 3840.00 MHz

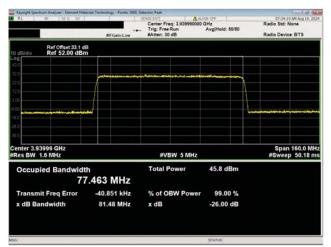


Port 1 80 MHz Channel Bandwidth QPSK Modulation Low Channel, 3740.01 MHz

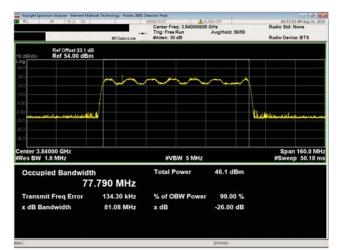


Port 1 80 MHz Channel Bandwidth QPSK Modulation Mid Channel, 3840.00 MHz

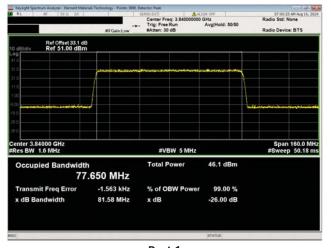




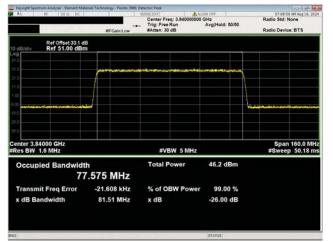
Port 1 80 MHz Channel Bandwidth QPSK Modulation High Channel, 3939.99 MHz



Port 1 80 MHz Channel Bandwidth 16QAM Modulation Mid Channel, 3840.00 MHz

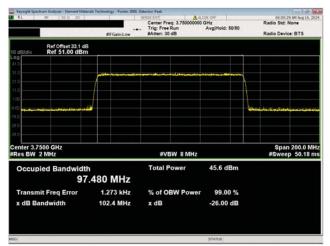


Port 1 80 MHz Channel Bandwidth 64QAM Modulation Mid Channel, 3840.00 MHz



Port 1 80 MHz Channel Bandwidth 256QAM Modulation Mid Channel, 3840.00 MHz

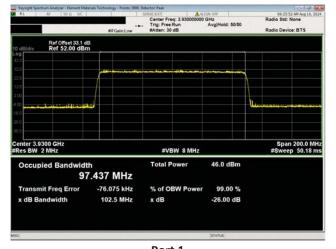




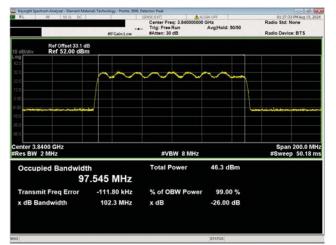
Port 1 100 MHz Channel Bandwidth QPSK Modulation Low Channel, 3750.00 MHz



Port 1 100 MHz Channel Bandwidth QPSK Modulation Mid Channel, 3840.00 MHz



Port 1 100 MHz Channel Bandwidth QPSK Modulation High Channel, 3930.00 MHz

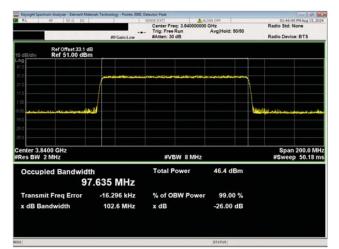


Port 1 100 MHz Channel Bandwidth 16QAM Modulation Mid Channel, 3840.00 MHz



Keysight Spectrum Analyzer - Element Mater	ials Technology - Points: 3000, 1			010
RL SF SED DC	#FGain:Low	Center Freq: 3.84000000	GHz Avg(Hold: 50/50	01:37:25 PH Aug 15, 202 Radio Std: None Radio Device: BTS
Ref Offset 33.1 dB dB/div Ref 51.00 dBm				
1.0				
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1.0				
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10				
90				
enter 3.8400 GHz Res BW 2 MHz		#VBW 8 MHz		Span 200.0 MH #Sweep 50.18 m
Occupied Bandwidth		Total Power	46.3 dBm	
97	.672 MHz			
<b>Transmit Freq Error</b>	38.393 kHz	% of OBW Power	99.00 %	
x dB Bandwidth	102.5 MHz	x dB	-26.00 dB	
			STATUS	

Port 1 100 MHz Channel Bandwidth 64QAM Modulation Mid Channel, 3840.00 MHz



Port 1 100 MHz Channel Bandwidth 256QAM Modulation Mid Channel, 3840.00 MHz



#### **TEST DESCRIPTION**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions at the edges of the authorized bands were measured on the low and high transmit frequencies of the available band. The channels closest to the band edges were selected. The EUT was transmitting at the power and data rate(s) listed in the datasheet.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per section 27.53(n)(1), For base station operations in the 3450-3550 MHz band, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm/MHz. This limit is adjusted to -31.1 dBm [-13 dBm -10 log(64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. Compliance with the provisions of this paragraph (n)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz.

Per section 27.53(n)(1),Notwithstanding the channel edge requirement of -13 dBm per megahertz, for base station operations in the 3450-3550 MHz band, the conducted power of any emission below 3440 MHz or above 3560 MHz shall not exceed -25 dBm/MHz. This limit is adjusted to -43.1 dBm [-25 dBm -10 log (64)] for the 3430 to 3440MHz & 3560 to 3570MHz ranges per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64-port MIMO transmitter.

Per section FCC 27.53(n) and FCC 27.53 (I)(1), power of any emission outside of the authorized operating frequency range cannot exceed, of the two rule parts, the more restrictive limits. Per section 27.53(n), the power of any emission outside band edge region (frequency ranges below 3430MHz and above 3570MHz) cannot exceed -40 dBm/MHz. The limit is adjusted to 58.1 dBm [-40 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be 1MHz per FCC 27.53(n)(1).

The band edge testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

#### TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3239	ANE	2024-02-14	2025-02-14



EUT:	AVQQA Remote Radio Head	Work Order:	NOKI0075
Serial Number:	L1242403137	Date:	2024-08-19
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	David Le, John Rattanavong	Relative Humidity:	52.4%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0075-3
			NOKI0075-4

#### **TEST SPECIFICATIONS**

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

#### COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Band n77 carriers were enabled at maximum power levels for the 3.45 GHz band in single carrier operating mode configuration.

3.45G Band single Carrier operations: 3.45GHz Band Single Carrier at maximum power for each carrier bandwidth (10, 20, 30 & 40MHz) at Bottom, and Top channels while 3.7GHz Band single NR20 Carrier operates at 100 watts on middle channel.

#### **DEVIATIONS FROM TEST STANDARD**

None

#### CONCLUSION

Pass

Tested By

#### **TEST RESULTS**

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1					
10 MHz Channel Bandwidth					
QPSK Modulation					
Low Channel, 3455.01 MHz	3449 MHz - 3451 MHz	3450	-41.037	-31.1	Pass
	3448 MHz - 3449 MHz	N/A	-34.56	-31.1	Pass
	3440 MHz - 3448 MHz	3447.968	-36.277	-31.1	Pass
	3430 MHz - 3440 MHz	3438.87	-52.138	-43.1	Pass
	3100 MHz - 3430 MHz	3220.12	-69.008	-58.1	Pass
High Channel, 3544.995 MHz	3549 MHz - 3551 MHz	3550	-37.707	-31.1	Pass
	3551 MHz - 3552 MHz	N/A	-36.25	-31.1	Pass
	3552 MHz - 3560 MHz	3552.088	-36.416	-31.1	Pass
	3560 MHz - 3570 MHz	3560.1	-51.304	-43.1	Pass
	3570 MHz - 3680 MHz	3615.54	-63.068	-58.1	Pass

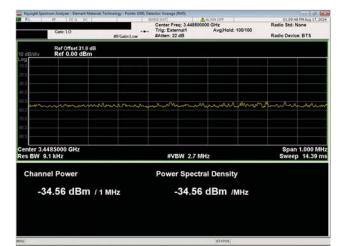


	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
20 MHz Channel Bandwidth	Kange	(141112)	(dbiii)	(dbiii)	Kesun
QPSK Modulation					
	2440 MUT 2451 MUT	2450	22,720	21.1	Deep
Low Channel, 3460.02 MHz	3449 MHz - 3451 MHz 3448 MHz - 3449 MHz	3450 N/A	-32.739 -32.88	-31.1 -31.1	Pass
	3440 MHz - 3449 MHz 3440 MHz - 3448 MHz	3448		-31.1	
	3440 MHz - 3440 MHz 3430 MHz - 3440 MHz		-34.791	-43.1	Pass
	3430 MHz - 3440 MHz 3100 MHz - 3430 MHz	3439.96 3234.64	-51.573 -68.982	-43.1	Pass
	3100 IVINZ - 3430 IVINZ	3234.04	-00.902		Pass
High Channel, 3540.00 MHz	3549 MHz - 3551 MHz	3550	-32.345	-31.1	Pass
	3551 MHz - 3552 MHz	N/A	-34.04	-31.1	Pass
	3552 MHz - 3560 MHz	3552.008	-35.079	-31.1	Pass
	3560 MHz - 3570 MHz	3560	-51.039	-43.1	Pass
	3570 MHz - 3680 MHz	3580.45	-63.266	-58.1	Pass
30 MHz Channel Bandwidth					
QPSK Modulation					
Low Channel, 3465.00 MHz	3449 MHz - 3451 MHz	3450	-33.593	-31.1	Pass
	3448 MHz - 3449 MHz	N/A	-33.09	-31.1	Pass
	3440 MHz - 3448 MHz	3448	-34.569	-31.1	Pass
	3430 MHz - 3440 MHz	3438.91	-51.239	-43.1	Pass
	3100 MHz - 3430 MHz	3195.37	-69.063	-58.1	Pass
High Channel, 3534.99 MHz	3549 MHz - 3551 MHz	3550	-33.309	-31.1	Pass
<b>°</b>	3551 MHz - 3552 MHz	N/A	-33.15	-31.1	Pass
	3552 MHz - 3560 MHz	3552	-34.021	-31.1	Pass
	3560 MHz - 3570 MHz	3560	-50.586	-43.1	Pass
	3570 MHz - 3680 MHz	3620.38	-63.198	-58.1	Pass
40 MHz Channel Bandwidth					
QPSK Modulation					
Low Channel, 3470.01 MHz	3449 MHz - 3451 MHz	3450	-32.056	-31.1	Pass
	3448 MHz - 3449 MHz	N/A	-32.28	-31.1	Pass
	3440 MHz - 3448 MHz	3447.952	-32.967	-31.1	Pass
	3430 MHz - 3440 MHz	3439.32	-50.725	-43.1	Pass
	3100 MHz - 3430 MHz	3100.99	-68.98	-58.1	Pass
High Channel, 3529.98 MHz	3549 MHz - 3551 MHz	3550	-32.614	-31.1	Pass
	3551 MHz - 3552 MHz	N/A	-31.42	-31.1	Pass
	3552 MHz - 3560 MHz	3552.048	-32.039	-31.1	Pass
	3560 MHz - 3570 MHz	3560	-49.59	-43.1	Pass
	3570 MHz - 3680 MHz	3583.31	-63.106	-58.1	Pass

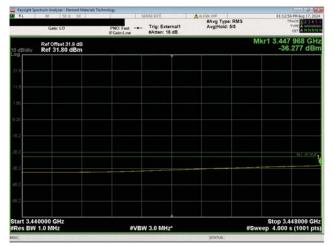




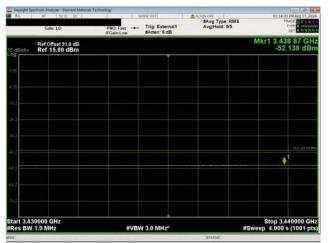
Port 1 10 MHz Channel Bandwidth QPSK Modulation Low Channel, 3455.01 MHz



Port 1 10 MHz Channel Bandwidth QPSK Modulation Low Channel, 3455.01 MHz

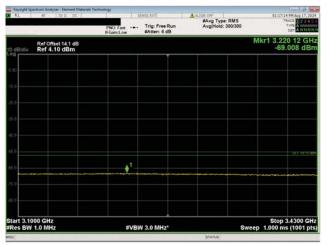


Port 1 10 MHz Channel Bandwidth QPSK Modulation Low Channel, 3455.01 MHz



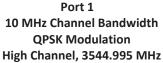
Port 1 10 MHz Channel Bandwidth QPSK Modulation Low Channel, 3455.01 MHz

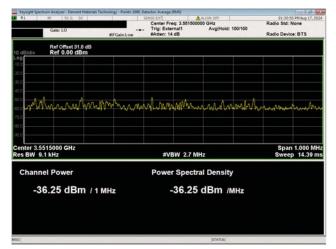




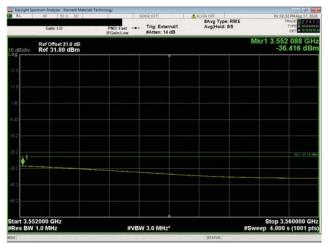
Port 1 10 MHz Channel Bandwidth QPSK Modulation Low Channel, 3455.01 MHz





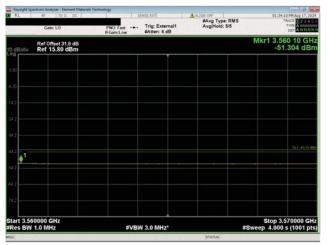


Port 1 10 MHz Channel Bandwidth QPSK Modulation High Channel, 3544.995 MHz

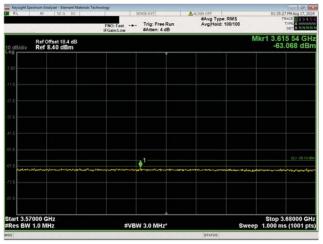


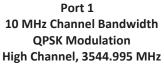
Port 1 10 MHz Channel Bandwidth QPSK Modulation High Channel, 3544.995 MHz

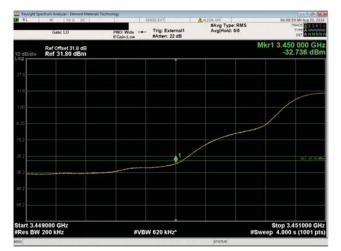




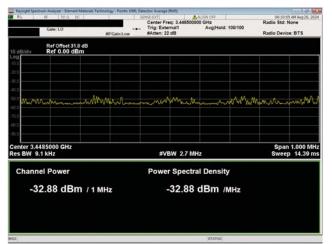
Port 1 10 MHz Channel Bandwidth QPSK Modulation High Channel, 3544.995 MHz





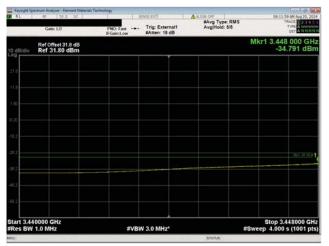


Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3460.02 MHz

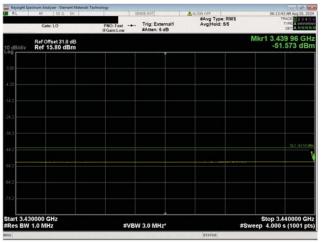


Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3460.02 MHz

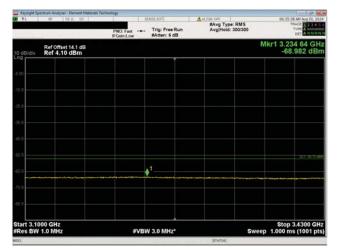




Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3460.02 MHz





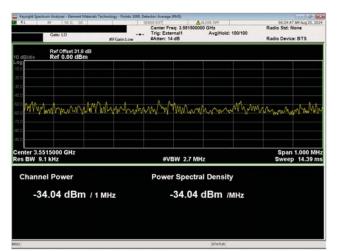


Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3460.02 MHz

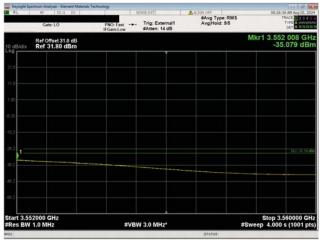
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Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3540.00 MHz

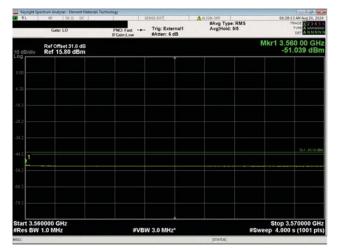




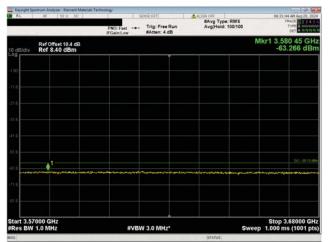
Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3540.00 MHz



Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3540.00 MHz

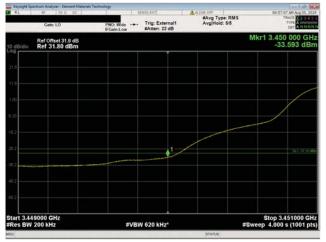


Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3540.00 MHz



Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3540.00 MHz

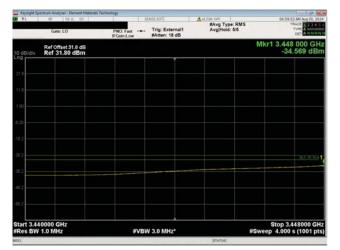




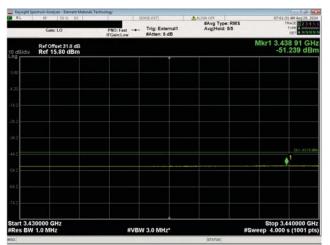
Port 1 30 MHz Channel Bandwidth QPSK Modulation Low Channel, 3465.00 MHz

RL	RF SER DC Gate: LO		FGaintow	Center Fr Trig: Exte #Atten: 20	eq: 3.44850000 mai1	0 GHz Avg(Hold: 1	00/100	Radio Std: I Radio Devic	
o dBidiv og	Ref Offset 31.8 Ref 0.00 dBn								
00 00 00 00 00 00	uhunun	MMM	hm	www	MAM	mum	www	Wellmann.	MARYU
enter 3.44 es BW 9.1	85000 GHz I kHz			#VI	BW 2.7 MH	z			1.000 M p 14.39 r
	el Power 8.09 dBm	/ 1 MH	,			Density			

Port 1 30 MHz Channel Bandwidth QPSK Modulation Low Channel, 3465.00 MHz

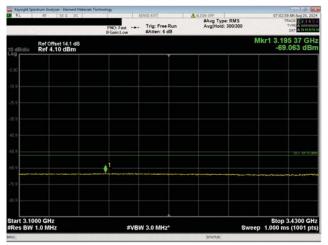


Port 1 30 MHz Channel Bandwidth QPSK Modulation Low Channel, 3465.00 MHz



Port 1 30 MHz Channel Bandwidth QPSK Modulation Low Channel, 3465.00 MHz

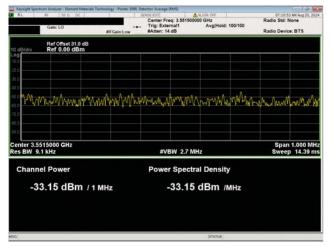




Port 1 30 MHz Channel Bandwidth QPSK Modulation Low Channel, 3465.00 MHz



Port 1 30 MHz Channel Bandwidth QPSK Modulation High Channel, 3534.99 MHz

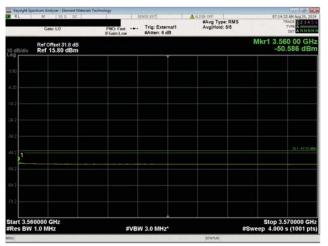


Port 1 30 MHz Channel Bandwidth QPSK Modulation High Channel, 3534.99 MHz 
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 AvgR hold
 State State

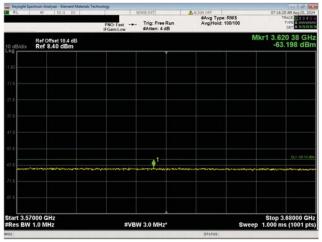
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 PRO 2000
 PRO 2000

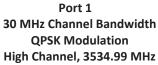
Port 1 30 MHz Channel Bandwidth QPSK Modulation High Channel, 3534.99 MHz

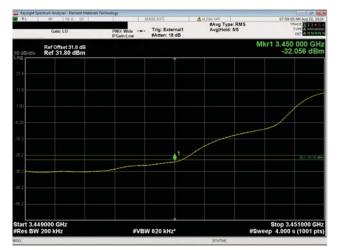




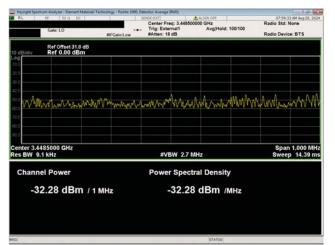
Port 1 30 MHz Channel Bandwidth QPSK Modulation High Channel, 3534.99 MHz





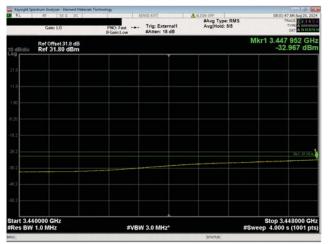


Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3470.01 MHz

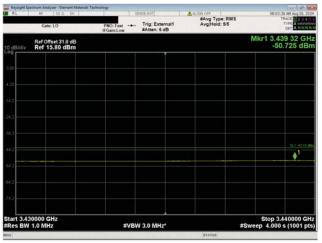


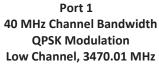
Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3470.01 MHz

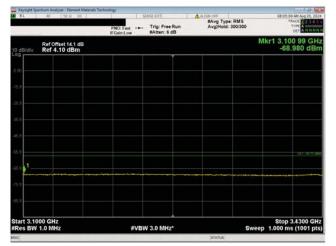




Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3470.01 MHz





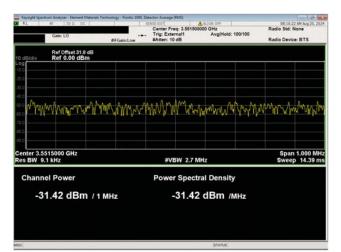


Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3470.01 MHz

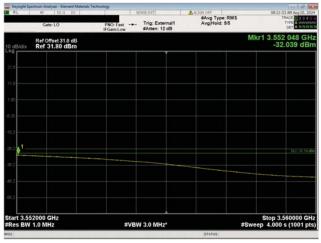
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Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3529.98 MHz





Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3529.98 MHz





RL IF Ga	58 0 DC	PNO: Fast	Trig: External1	#Avg Type: RMS Avg(Hold: 5/5	TRU T	APA Aug 20, 202 AGE 12349 APE A NUMBER
Ref O	ffset 31.8 dB 15.80 dBm	it same or			Mkr1 3.560 -49.5	00 GH 590 dBn
500						
14.2						
24.2						
31.2						
42.4						
912						
42						
74.2						
tart 3.560000 Res BW 1.0 M	GHz Hz	#VB	W 3.0 MHz*		Stop 3.57 #Sweep 4.000 s	0000 GH

Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3529.98 MHz

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Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3529.98 MHz



#### **TEST DESCRIPTION**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions at the edges of the authorized bands were measured on the low and high transmit frequencies of the available band. The channels closest to the band edges were selected. The EUT was transmitting at the power and data rate(s) listed in the datasheet.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per section 27.53(I)(1), For base station operations in the 3700-3980 MHz band, the conducted power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. This limit is adjusted to -31.1 dBm [-13 dBm - 10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter.

Per 27.53(I)(1), emissions seen up to 1 MHz outside of authorized operating frequency range band edges shall be measured with a RBW of 1% of the measured emission bandwidth. Any emission seen to be > 1 MHz further outside the band edges shall be measured with a RBW of 1 MHz. However, a narrower RBW of at least 1% of the emission bandwidth is still allowed provided that the measured power is integrated over the full reference bandwidth of 1 MHz.

The band edge testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e)

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3239	ANE	2024-02-14	2025-02-14



EUT:	AVQQA Remote Radio Head	Work Order:	NOKI0075
Serial Number:	L1242403137	Date:	2024-08-15
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	David Le, John Rattanavong	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0075-4

#### **TEST SPECIFICATIONS**

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

#### COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks. Band n77 carriers were enabled at maximum power levels for the 3.7 GHz band in the single carrier operating mode configuration.

#### **DEVIATIONS FROM TEST STANDARD**

None

#### CONCLUSION

Pass

Tested By

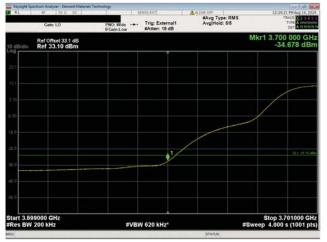
#### **TEST RESULTS**

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
ort 1	Range	(11112)	(ubiii)	(ubiii)	Result
20 MHz Channel Bandwidth QPSK Modulation					
Low Channel, 3710.01 MHz	3699 MHz to 3701 MHz	3700	-34.678	-31.1	Pass
	3698 MHz to 3699 MHz	N/A	-33.32	-31.1	Pass
	3550 MHz to 3698 MHz	3698	-34.484	-31.1	Pass
High Channel, 3969.99 MHz	3979 MHz to 3981 MHz	3980	-35.35	-31.1	Pass
-	3981 MHz to 3982 MHz	N/A	-32.65	-31.1	Pass
	3982 MHz to 4130 MHz	3982	-34.128	-31.1	Pass
40 MHz Channel Bandwidth QPSK Modulation					1
Low Channel, 3720.00 MHz	3699.6 MHz to 3700.0 MHz	N/A	-34.6	-31.1	Pass
	3699.2 MHz to 3699.6 MHz	N/A	-35.65	-31.1	Pass
	3699.0 MHz to 3699.4 MHz	N/A	-36.23	-31.1	Pass
	3698 MHz to 3699 MHz	N/A	-33.24	-31.1	Pass
	3550 MHz to 3698 MHz	3697.852	-33.451	-31.1	Pass
High Channel, 3960.00 MHz	3980.0 MHz to 3980.4 MHz	N/A	-36.01	-31.1	Pass
	3980.4 MHz to 3980.8 MHz	N/A	-36.36	-31.1	Pass
	3980.6 MHz to 3981.0 MHz	N/A	-35.85	-31.1	Pass
	3981 MHz to 3982 MHz	N/A	-32.95	-31.1	Pass
	3982 MHz to 4130 MHz	3982	-33.091	-31.1	Pass



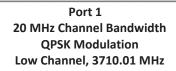
	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
60 MHz Channel Bandwidth	Rungo	(	(dbiii)	(dbiii)	Robuit
QPSK Modulation					
Low Channel, 3730.02 MHz	3699.4 MHz to 3700.0 MHz	N/A	-32.52	-31.1	Pass
	3699.0 MHz to 3699.6 MHz	N/A	-33.49	-31.1	Pass
	3698 MHz to 3699 MHz	N/A	-32.38	-31.1	Pass
	3550 MHz to 3698 MHz	3698	-31.976	-31.1	Pass
High Channel, 3949.98 MHz	3980.0 MHz to 3980.6 MHz	N/A	-33.24	-31.1	Pass
	3980.4 MHz to 3981.0 MHz	N/A	-34.18	-31.1	Pass
	3981 MHz to 3982 MHz	N/A	-32.4	-31.1	Pass
	3982 MHz to 4130 MHz	3982.148	-32.733	-31.1	Pass
80 MHz Channel Bandwidth QPSK Modulation					
Low Channel, 3740.01 MHz	3699.2 MHz to 3700 MHz	N/A	-32.32	-31.1	Pass
	3699.0 MHz to 3699.8 MHz	N/A	-33.2	-31.1	Pass
	3698 MHz to 3699 MHz	N/A	-32.47	-31.1	Pass
	3550 MHz to 3698 MHz	3697.704	-32.957	-31.1	Pass
High Channel, 3939.99 MHz	3980.0 MHz to 3980.8 MHz	N/A	-32.21	-31.1	Pass
	3980.2 MHz to 3981 MHz	N/A	-32.81	-31.1	Pass
	3981 MHz to 3982 MHz	N/A	-32.23	-31.1	Pass
	3982 MHz to 4130 MHz	3982.296	-32.85	-31.1	Pass
100 MHz Channel Bandwidth QPSK Modulation					
Low Channel, 3750.00 MHz	3699 MHz to 3700 MHz	N/A	-32.33	-31.1	Pass
·	3698 MHz to 3699 MHz	N/A	-31.92	-31.1	Pass
	3550 MHz to 3698 MHz	3697.408	-32.541	-31.1	Pass
High Channel, 3930.00 MHz	3980 MHz to 3981 MHz	N/A	-32.6	-31.1	Pass
-	3981 MHz to 3982 MHz	N/A	-32.71	-31.1	Pass
	3982 MHz to 4130 MHz	3982	-32.607	-31.1	Pass

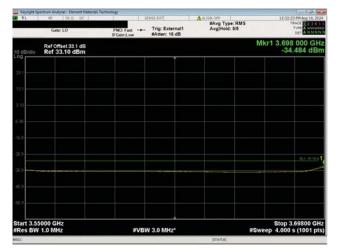




Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3710.01 MHz

	Gate: LO	#FGaintow	Center Freq Trig: Extern #Atten: 18 d	: 3.69850000 al1	Alton orr 00 GHz Avg(Hold: 1	00/100	Radio Std: N Radio Device	
) dBldiv	Ref Offset 33.1 dB Ref 1.40 dBm							
60 1.6								
16								
Prostant of	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	mahan	mun		mm	mm	mm	martin
.6								
16 15								
enter 3.69 es BW 9.	985000 GHz 1 kHz		#VB\	N 2.7 MH	Iz			1.000 MH 14.39 m
Channe	el Power		Power	Spectra	I Density			
-3:	3.32 dBm / 1	MHz	1	33.32	dBm /N	IHz		



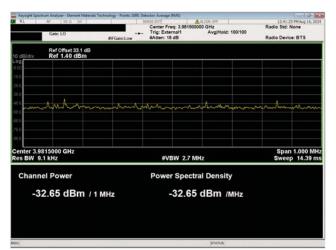


Port 1 20 MHz Channel Bandwidth QPSK Modulation Low Channel, 3710.01 MHz

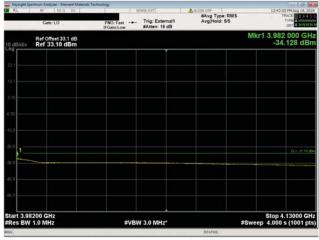
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Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3969.99 MHz





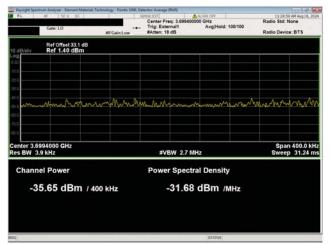
Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3969.99 MHz



Port 1 20 MHz Channel Bandwidth QPSK Modulation High Channel, 3969.99 MHz

RL RF SER D	c #FGain:Low		Center Freq: 3.69980000 Trig: External1 #Atten: 18 dB	ALION OFF 00 GHz Avg(Hold:	100/100	Radio Std: N Radio Devic	
Ref Offset 33. dB/div Ref 1.40 dE							
16							
momme	mmmmm	M	www.	Marmh	hman	mann	munim
0 6 16							
enter 3.6998000 GHz es BW 3.9 kHz			#VBW 2.7 MH	z			400.0 kH 31.24 m
Channel Power			Power Spectra	I Density	4		
-34.60 dBr	n / 400 kHz		-30.62	dBm //	MHz		
2		_		STATUS			

Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz



Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz



RL RF 54	a pc	#FGain:Low	Center Freq: 3.699200 Trig: External1 #Atten: 18 dB	Auton off 0000 GHz Avg(Hold: 100/100	11:27:31 AH Aug 16, 20 Radio Std: None Radio Device: BTS
	et 33.1 dB 10 dBm				
E0 1.6					
16					
Andread	hander	mmmm	minan	mmmmmm	mmmmm
10 36					
enter 3.6992000 G es BW 3.9 kHz	Hz		#VBW 2.7 N	IHz	Span 400.0 kH Sweep 31.24 m
Channel Powe	er		Power Spect	ral Density	
-36.23 c	IBm / 4	00 kHz	-32.25	dBm /MHz	
a				STATUS	

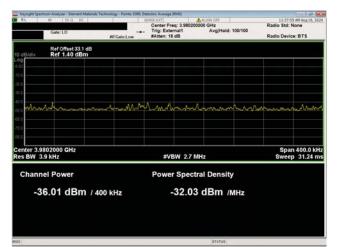
Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz

Keysight Spectrum Analyzer - Element Materials Techi KL RF 50 0 0C Gate: LO	1	Center Freq: 3.6 Trig: External1 #Atten: 16 dB	Auton orr 98500000 GHz Avg[Hold:	100/100	11:28:50 MH Aug 16, Radio Std: None Radio Device: BTS
Ref Offset 33.1 dB Ref 1.40 dBm					
8.60					
11.6 					
99.6 					
manna manna	mmum	inhuman	homen	www	Norman
EII.0 74 C					
85 fi					
Center 3.6985000 GHz Res BW 9.1 kHz		#VBW :	2.7 MHz		Span 1.000 M Sweep 14.39
Channel Power		Power Sp	ectral Densit	Y	
-33.24 dBm / 1 M	Hz	-33	.24 dBm /	MHz	

Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz

RL RF 50 0 DC	9	ENSE-EXT	ALIGN OFF	11:30:36 AM Aug 16, 202
Gate: LO	PNO: Fast IFGain:Low	Trig: External1 #Atten: 16 dB	#Avg Type: RMS Avg[Hold: 5/5	TRACE 12345 Type A MMNNN DET A NNNN
Ref Offset 33.1 dB gB/div Ref 33.10 dBm			м	kr1 3.697 852 GH -33.451 dBr
°g				
15.1				
31				
110				
50				
6.9				
é 9				0.1.21.10.0
6.9				
6.9				
6.9				
tart 3.55000 GHz Res BW 1.0 MHz		V 3.0 MHz*		Stop 3.69800 GH eep 4.000 s (1001 pt

Port 1 40 MHz Channel Bandwidth QPSK Modulation Low Channel, 3720.00 MHz

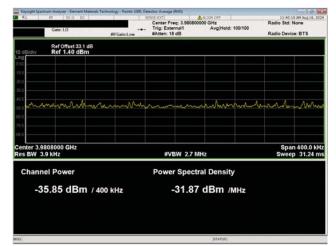


Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz

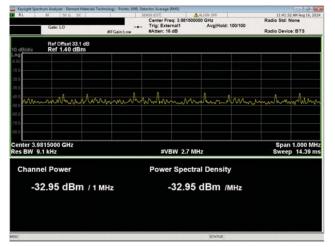


	Element Materials 7 9 R DC	echoology - Ponts 1000	ogy - Poets 1000, Detector: Average (RMS) SENSE-SCIT ALLON OFF Center Freg: 3.980600000 GHz					11:09:03 AM Aug 16, 20 Radio Std: None	
Gate: LO		#FGainLow	Trig: Extern #Atten: 18 d	alt	Avg(Hold: 1	00/100	Radio Device	BTS	
0 dBldiv Ref 1.	set 33.1 dB 40 dBm								
og (6)									
16									
.6									
mankin	man	mon	- Marchen	which	nnh	nhm			
5									
16									
enter 3.9806000 GHz es BW 3.9 kHz			#VB	Span 400.0 kl Sweep 31.24 n					
Channel Pow	er		Power						
-36.36	dBm / 40	00 kHz	-	32.38	dBm /м	Hz			
a					STATUS				

Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz



Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz



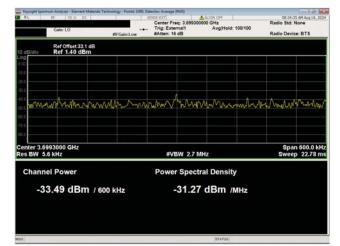
Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz 
 Reperturbative
 State off
 State off

Port 1 40 MHz Channel Bandwidth QPSK Modulation High Channel, 3960.00 MHz

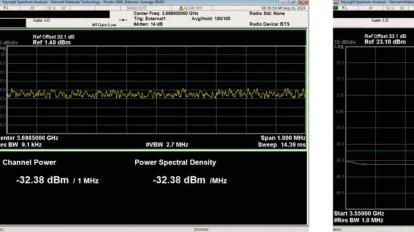


RL RL	um Analyzer - Bernent N RF 59 0 DC			Center Fre	q: 3.69970000			08:33:1 Radio Std: I	2 AH Aug 16, 202
	Gate: LO	MEG	aint.ow	Trig: Exter #Atten: 16		Avg Hold:	100/100	Radio Devic	e: BTS
) dB/div	Ref Offset 33.1 Ref 1.40 dBr								
15 15						i N	A		
mm	mmmMmM	AMA	norman	mm	mm	No-Many 1	ar World	manyany	at Wow WW
9 6									
enter 3.69	97000 GHz			#VB	W 2.7 MH				n 600.0 kH p 22.78 m
	el Power				Spectra		/	SHEE	22.7011
-32	2.52 dBm	/ 600 kH	z	2	30.30	dBm /	MHz		
1						STATUS			

Port 1 60 MHz Channel Bandwidth QPSK Modulation Low Channel, 3730.02 MHz



Port 1 60 MHz Channel Bandwidth QPSK Modulation Low Channel, 3730.02 MHz



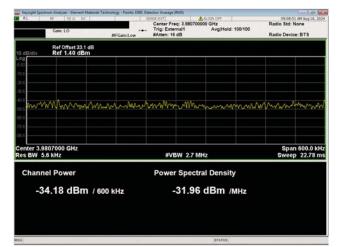
Port 1 60 MHz Channel Bandwidth QPSK Modulation Low Channel, 3730.02 MHz 
 Royal (1)
 Royal (1)
 Rest (1)

Port 1 60 MHz Channel Bandwidth QPSK Modulation Low Channel, 3730.02 MHz

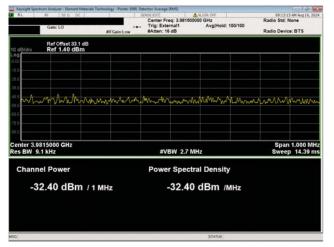


Keysight Spectrum Analyzer - Element Materia				Fold &
RL RF 500 DC	1 1 1	Center Freq: 3.980300		09:07:42 AM Aug 16, 202 Radio Std: None
Gate: LO	#FGaint ow	Trig: External1 #Atten: 16 dB	Avg(Hold: 100/100	Radio Device: BTS
	#HGain1.0w	extent. To up		Radio Device, B13
Ref Offset 33.1 dB				
D dBldiv Ref 1.40 dBm				
10				
6				
6				
15				
5 A	Alexand A			
W Manaham M	W MALLEN MA	mount	Mar and marken	mannen
c.				
¥				
enter 3.9803000 GHz				Span 600.0 kH
es BW 5.6 kHz		#VBW 2.7 M	IHz	Sweep 22.78 m
		000000000000000000000000000000000000000		
Channel Power		Power Spectr	ral Density	
-33.24 dBm /	600 kHz	-31.03	dBm /MHz	
			STATUS	

Port 1 60 MHz Channel Bandwidth QPSK Modulation High Channel, 3949.98 MHz



Port 1 60 MHz Channel Bandwidth QPSK Modulation High Channel, 3949.98 MHz



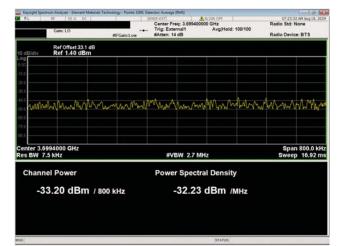
Port 1 60 MHz Channel Bandwidth QPSK Modulation High Channel, 3949.98 MHz 
 Normal Status
 <thS

Port 1 60 MHz Channel Bandwidth QPSK Modulation High Channel, 3949.98 MHz



-32.32 dBm / 80	0 kHz	-31.35	dBm /мнz	
Channel Power		Power Spectr		
enter 3.6996000 GHz es BW 7.5 kHz		#VBW 2.7 MI	Hz	Span 800.0 kH Sweep 16.92 n
6 6				
homenonoman	numm	whenter	marker	WMannaman
6				
dBldiv Ref 1.40 dBm				
Ref Offset 33.1 dB	MI-GainLow	soluti. 14 UD		Radio Device, 613
Gate: LO	#FGaint.ow	Center Freq: 3.6996000 Trig: External1 #Atten: 14 dB	Avg[Hold: 100/100	Radio Std: None Radio Device: BTS

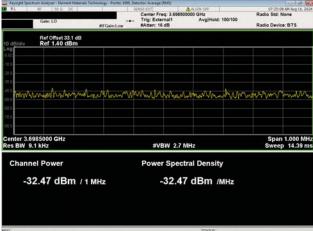
Port 1 80 MHz Channel Bandwidth QPSK Modulation Low Channel, 3740.01 MHz



Port 1 80 MHz Channel Bandwidth QPSK Modulation Low Channel, 3740.01 MHz



Port 1 80 MHz Channel Bandwidth QPSK Modulation Low Channel, 3740.01 MHz

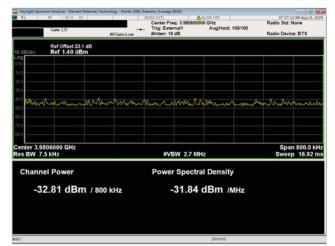


Port 1 80 MHz Channel Bandwidth QPSK Modulation Low Channel, 3740.01 MHz

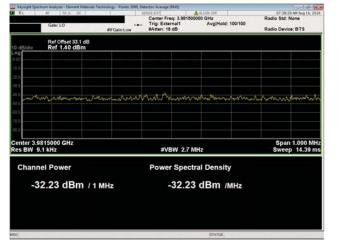


	num Analyzer - Element Mater #F 3/2 Ω DC			INSE-EXCT	ALTON DEF			AH Aug 16, 202
	Gate: LO	#FGain:Low		Center Freq: 3.9804000 Trig: External1 #Atten: 18 dB	00 GHz Avg(Hold: 1	00/100	Radio Std: N Radio Device	100
) dBldiv	Ref Offset 33.1 dB Ref 1.40 dBm							
60 1.6								
6								
Ann	minth	Mohan	m	mmmmm	Mmm	Martin	mm	mm
6								
5								
enter 3.98 es BW 7.	804000 GHz .5 kHz			#VBW 2.7 MH	iz			800.0 kH 16.92 m
Channe	el Power			Power Spectra				
-3	2.21 dBm	800 kHz		-31.24	dBm /M	Hz		

Port 1 80 MHz Channel Bandwidth QPSK Modulation High Channel, 3939.99 MHz



Port 1 80 MHz Channel Bandwidth QPSK Modulation High Channel, 3939.99 MHz



Port 1 80 MHz Channel Bandwidth QPSK Modulation High Channel, 3939.99 MHz 
 Openal Status
 Status

Port 1 80 MHz Channel Bandwidth QPSK Modulation High Channel, 3939.99 MHz



	m Analyzer - Bernerit Material RF 59 0 DC	Technology - Points: 1000,	Center Freq: 3.699500	06-02-38 AH Avg 16, 20 Radio Std: None	
	Gate: LO	#FGainLow	Trig: External1 #Atten: 18 dB	Avg[Hold: 100/100	Radio Device: BTS
0 dBJdiv	Ref Offset 33.1 dB Ref 1.40 dBm				
60 1.6					
1.6					
yum	mmmm	termin	mmahand	hun march	mmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmmm
1.5					
16					
enter 3.699 es BW 9.1			#VBW 2.7 N	IHz	Span 1.000 MH Sweep 14.39 m
Channe	l Power		Power Spect		
-32	.33 dBm /	1 MHz	-32.33	dBm /MHz	
6				STATUS	

Port 1 100 MHz Channel Bandwidth QPSK Modulation Low Channel, 3750.00 MHz

RL RF SED DC	#FGainLow	Sense Scrift Center Freq: 3.69850000 GHz Trig: External Avg(Hold: 100/1 #Atten: 18 dB	06:02:55 AM Aug 16, 20 Radio Std: None 00 Radio Device: BTS
Ref Offset 33.1 dB 0 dB/div Ref 1.40 dBm			
1 60 11 £			
mmmm	vmmmmmmm	mmmmmmm	mannan
8.6			
enter 3.6985000 GHz es BW 9.1 kHz		#VBW 2.7 MHz	Span 1.000 Mi Sweep 14.39 n
Channel Power		Power Spectral Density	
-31.92 dBm /	1 MHz	-31.92 dBm /мнz	:
-51.52 dBiii /	T MITIZ	-31.32 dbin /mhz	

Port 1 100 MHz Channel Bandwidth QPSK Modulation Low Channel, 3750.00 MHz

RL	ectrum Analyzer - Element Materials RF 50 Q DC		SENSE FOR	ALIGN OFF	06-09-34 AM Aug 16, 203
	Gate: LO	PNO: Fast	Trig: External1 #Atten: 16 dB	#Avg Type: RMS Avg(Hold: 5/5	TRACE 12 2 3 4 TYPE A WANNA DET A N N N N
0 dB/div	Ref Offset 33.1 dB Ref 33.10 dBm				Mkr1 3.697 408 GH -32.541 dBr
.0g			h a s		
25.1					
13.1					
1.10					
.50					
16.9					
6.9					0(1-29.10)6
6.9					0(1.5) (6)
6.9					
¥6.9					
	5000 GHz 1.0 MHz	#VB	W 3.0 MHz*	#	Stop 3.69800 GH Sweep 4.000 s (1001 pt

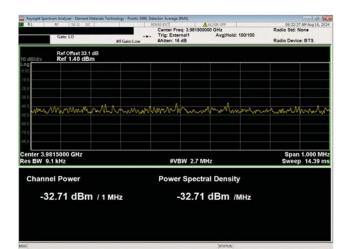
Port 1 100 MHz Channel Bandwidth QPSK Modulation Low Channel, 3750.00 MHz

	set 33.1 dB 40 dBm						
0 6 6							
Manna	maraha	MMM	mm	Manne	AmoraMaria	mana	ŴŴ
	in the set of						
5							
nter 3.9805000 G s BW 9.1 kHz	Hz		#VB\	V 2.7 MHz		Span 1.000 Sweep 14.3	
Channel Pow	er		Power				
-32.60 0	Bm / 1 M	/Hz	-3	2.60 dBn	n /MHz		

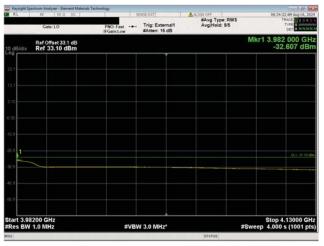
Port 1 100 MHz Channel Bandwidth QPSK Modulation High Channel, 3930.00 MHz

### **BAND EDGE COMPLIANCE - BAND 3.7G**





Port 1 100 MHz Channel Bandwidth QPSK Modulation High Channel, 3930.00 MHz



Port 1 100 MHz Channel Bandwidth QPSK Modulation High Channel, 3930.00 MHz



#### **TEST DESCRIPTION**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions at the edges of the authorized bands were measured on the low and high transmit frequencies of the available band. The channels closest to the band edges were selected. The EUT was transmitting at the power and data rate(s) listed in the datasheet.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per section 27.53(n)(1), For base station operations in the 3450-3550 MHz band, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm/MHz. This limit is adjusted to -31.1 dBm [-13 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. Compliance with the provisions of this paragraph (n)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz.

Per section 27.53(I)(1), For base station operations in the 3700-3980 MHz band, the power of any emission outside of the authorized operating frequency range cannot exceed -13dBm. This limit is adjusted to -31.1 dBm [-13 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter.

Per section 27.53(n)(1),Notwithstanding the channel edge requirement of -13 dBm per megahertz, for base station operations in the 3450-3550 MHz band, the conducted power of any emission below 3440 MHz or above 3560 MHz shall not exceed -25 dBm/MHz. This limit is adjusted to -43.1 dBm [-25 dBm -10 log (64)] for the 3430 to 3440MHz & 3560 to 3570MHz ranges per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter.

Per section FCC 27.53(n) and FCC 27.53 (I)(1), power of any emission outside of the authorized operating frequency range cannot exceed, of the two rule parts, the more restrictive limits. Per section 27.53(n), the power of any emission outside band edge region (frequency ranges below 3430MHz and above 3570MHz) cannot exceed -40 dBm/MHz. This limit is adjusted to -58.1 dBm [-40 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter. The resolution bandwidth to be used for these measurements must be 1MHz per FCC 27.53(n)(1).

#### Dual band with 3.45G and 3.7G Band carriers operations test cases using QPSK only:

- a. *Test Case 1.* 3.7GHz Band NR20 Carrier at maximum power at the Top channel. 3.45GHz Band NR20 Carrier at maximum power at the bottom channel operating simultaneously. Both carriers are operating at the same power level (1.56W/carrier). Total radio power is 200W.
- b. *Test Case 2*. 3.7GHz Band NR20 Carrier at maximum power at the Bottom channel. 3.45GHz Band NR20 Carrier at maximum power at the top channel operating simultaneously. Both carriers are operating at the same power level (1.56W/carrier). Total radio power is 200W.
- c. *Test Case 3.* 3.7GHz Band NR100 Carrier at the top channel. 3.45GHz Band NR40 Carrier at the bottom channel operating simultaneously. Both carriers are operating at the same PSD level (3.75W/carrier for NR100 carrier or PSD level at 2.4W/MHz and 1.56W/carrier for NR40 carrier or PSD level at 2.5W/MHz). Total radio power is 340W.



#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3239	ANE	2024-02-14	2025-02-14



EUT:	AVQQA Remote Radio Head	Work Order:	NOKI0075
Serial Number:	L1242403137	Date:	2024-08-16
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	David Le, John Rattanavong	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0075-3
			NOKI0075-4

#### **TEST SPECIFICATIONS**

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

#### COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks.

#### **DEVIATIONS FROM TEST STANDARD**

None

#### CONCLUSION

Pass

Tested By

#### **TEST RESULTS**

	Frequency	Frequency	Value	Limit	
	Range	(MHz)	(dBm)	(dBm)	Result
Port 1					
QPSK Modulation					
Test Case 1					
	3449 MHz to 3450 MHz	3450	-32.877	-31.1	Pass
	3448 MHz to 3449 MHz	N/A	-33.98	-31.1	Pass
	3440 MHz to 3448 MHz	3447.952	-34.739	-31.1	Pass
	3430 MHz to 3440 MHz	3438.52	-51.659	-43.1	Pass
	3979 MHz to 3981 MHz	3980	-32.454	-31.1	Pass
	3981 MHz to 3982 MHz	N/A	-33.32	-31.1	Pass
	3982 MHz to 4000 MHz	3982.144	-33.02	-31.1	Pass
Test Case 2					
	3549 MHz to 3551 MHz	3550	-35.845	-31.1	Pass
	3551 MHz to 3532 MHz	N/A	-33.32	-31.1	Pass
	3552 MHz to 3560 MHz	3552.064	-34.799	-31.1	Pass
	3560 MHz to 3570 MHz	3560.03	-51.262	-43.1	Pass
	3699 MHz to 3701 MHz	3700	-34.904	-31.1	Pass
	3698 MHz to 3699 MHz	N/A	-33.81	-31.1	Pass
	3680 MHz to 3698 MHz	3697.982	-33.669	-31.1	Pass

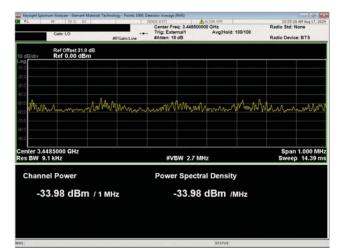


	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Test Case 3			, <i>i</i>	, <i>t</i>	
	3449 MHz to 3450 MHz	3450	-34.975	-31.1	Pass
	3448 MHz to 3449 MHz	N/A	-33.12	-31.1	Pass
	3440 MHz to 3448 MHz	3447.976	-33.891	-31.1	Pass
	3430 MHz to 3440 MHz	3438.3	-50.977	-43.1	Pass
	3980 MHz to 3981 MHz	N/A	-31.94	-31.1	Pass
	3981 MHz to 3982 MHz	N/A	-32.04	-31.1	Pass
	3982 MHz to 4000 MHz	3982	-32.357	-31.1	Pass

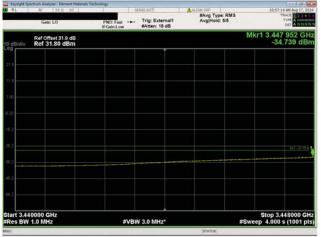




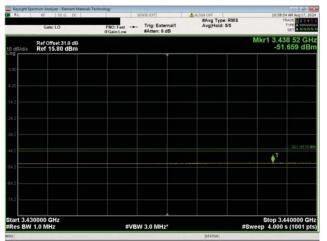
Port 1 QPSK Modulation Test Case 1



Port 1 QPSK Modulation Test Case 1



Port 1 QPSK Modulation Test Case 1

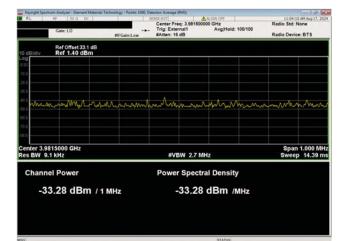


Port 1 QPSK Modulation Test Case 1





Port 1 QPSK Modulation Test Case 1



Port 1 QPSK Modulation Test Case 1

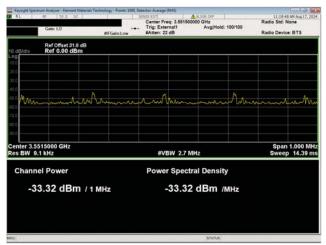
RL RF SPR DC	1 5	ENSE-EXT	ALIGN OFF	11:06:11 AM Aug 17, 20.
Gate: LO	PNO: Fast +++	Trig: External1 #Atten: 16 dB	#Avg Type: RMS Avg Hold: 5/5	TRACE 234 TYPE A WWWW DET A N N N P
dB/div Ref 33.1 dB			M	kr1 3.982 144 GH -33.020 dBi
°				
1				
0				
•				
2 1				
7				
9				
9				
art 3.982000 GHz es BW 1.0 MHz	#VBV	V 3.0 MHz*	#Sw	Stop 4.000000 GH eep 4.000 s (1001 pt
			STATUS	

Port 1 QPSK Modulation Test Case 1

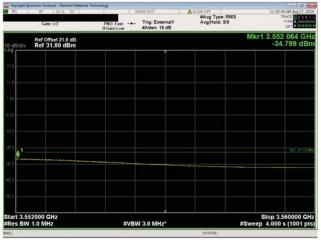


Port 1 QPSK Modulation Test Case 2





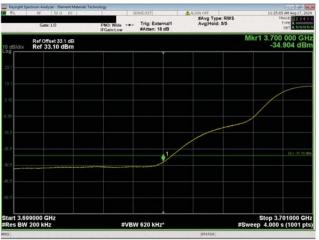
Port 1 QPSK Modulation Test Case 2



Port 1 QPSK Modulation Test Case 2

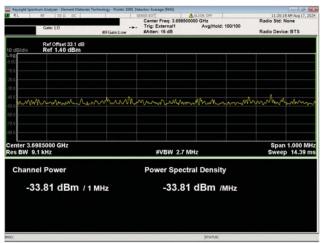
RL RF SER DC Gate: LO	PNO: Fast Trig: External1 IFGain:Low #Atten: 6 dB	#Aug Type: RMS Avg Hold: 5/5	11:22:25 AM Aug 17, 202 TRACE 12:34 TYPE DET N N N N
Ref Offset 31.8 dB			Mkr1 3.560 03 GH -51.262 dBn
90			
n			
2			
2			
2			
1			
2			
2			
2			
art 3.560000 GHz es BW 1.0 MHz	#VBW 3.0 MHz*	#Sw	Stop 3.570000 GH eep 4.000 s (1001 pt
		STATUS	- X4

Port 1 QPSK Modulation Test Case 2

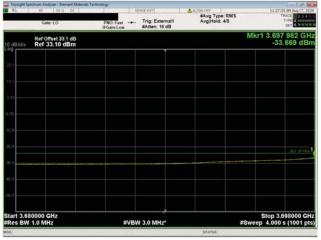


Port 1 QPSK Modulation Test Case 2

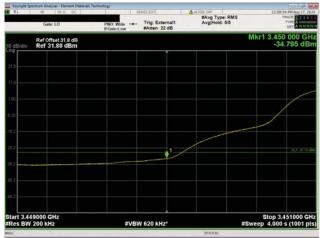




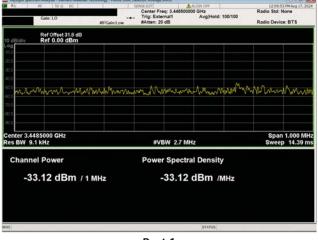
Port 1 QPSK Modulation Test Case 2



Port 1 QPSK Modulation Test Case 2



Port 1 QPSK Modulation Test Case 3



Port 1 QPSK Modulation Test Case 3





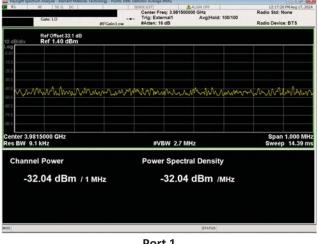
Port 1 QPSK Modulation Test Case 3



Port 1 QPSK Modulation Test Case 3

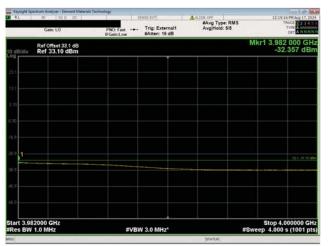
Ru Br 59.0 DC	als Technology - Points 1000, I		ALION OFF	12:16:00 PN Aug 17, 202
Gate: LO	#FGaintow	Center Freq: 3.980500		Radio Std: None Radio Device: BTS
Ref Offset 33.1 dB dBJdiv Ref 1.40 dBm				
6 5 5 6 6 6	mmunn	NAMANINA	www.muthanaman	n manananan manananan manananan manana karana ka Na karana kara
enter 3.9805000 GHz es BW 9.1 kHz		#VBW 2.7 N	IHz	Span 1.000 MH Sweep 14.39 m
Channel Power -31.94 dBm /	1 MHz	Power Spect	dBm /MHz	
a			STATUS	

Port 1 QPSK Modulation Test Case 3



Port 1 QPSK Modulation Test Case 3





Port 1 QPSK Modulation Test Case 3



#### **TEST DESCRIPTION**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

The spurious RF conducted emissions at the edges of the authorized bands were measured on the low and high transmit frequencies of the available band. The channels closest to the band edges were selected. The EUT was transmitting at the power and data rate(s) listed in the datasheet.

RF conducted emissions testing was performed only on one port. The AVQQA antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraph 5.7.2i.

The spectrum was scanned below the lower band edge and above the higher band edge.

Per section 27.53(I)(1), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -31.1 dBm [-13 dBm -10 log (64)] per FCC KDB 662911D01 v02r01 and ANSI C63.26-2015 section 6.4 because the BTS may operate as a 64 port MIMO transmitter.

Per 27.53(I)(1), emissions seen up to 1 MHz outside of authorized operating frequency range band edges shall be measured with a RBW of 1% of the measured emission bandwidth. Any emission seen to be > 1 MHz further outside the band edges shall be measured with a RBW of 1 MHz. However, a narrower RBW of at least 1% of the emission bandwidth is still allowed provided that the measured power is integrated over the full reference bandwidth of 1 MHz.

The band edge testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small and there is significant/good passing margin. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

#### 3.7G Band multi-carrier operations test cases using QPSK only:

- a. 3.7G Band Multicarrier Test Case 1: Two contiguous NR20 carriers with minimum spacing between carrier frequencies at the lower band edge (3710.01 & 3730.02MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power (~1.56W/carrier) with a total radio power of 200 watts.
- b. 3.7G Band Multicarrier Test Case 2: Two contiguous NR20 carriers with minimum spacing between carrier frequencies at the upper band edge (3949.98 & 3969.99 MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power (~1.56W/carrier) with a total radio power of 200 watts.
- c. 3.7G Band Multicarrier Test Case 3: Two contiguous NR100 carriers with minimum spacing between carrier frequencies at the lower band edge (3750.00 & 3850.02MHz). The largest channel bandwidth is selected to maximize radio power. The carrier power for NR100 is ~2.65W/carrier. The total radio power is 340 watts.
- d. 3.7G Band Multicarrier Test Case 4: Two contiguous NR100 carriers with minimum spacing between carrier frequencies at the upper band edge (3830.01 & 3930.00 MHz). The largest channel bandwidth is selected to maximize radio power The carrier power for NR100 is ~2.65W/carrier. The total radio power is 340 watts.
- e. 3.7G Band Multicarrier Test Case 5: Two non-contiguous NR20 carriers with maximum spacing between carrier frequencies at the lower band edge (3710.01 & 3889.995MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power (~1.56W/carrier) with a total radio power of 200 watts.



f. 3.7G Band Multicarrier Test Case 6: Two non-contiguous NR20 carriers with maximum spacing between carrier frequencies at the upper band edge (3789.99 & 3969.99MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power (~1.56W/carrier) with a total radio power of 200 watts.

#### **TEST EQUIPMENT**

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2024-03-12	2025-03-12
Generator - Signal	Agilent	N5173B	TIW	2023-08-07	2026-08-07
Block - DC	Fairview Microwave	SD3239	ANE	2024-02-14	2025-02-14



EUT:	AVQQA Remote Radio Head	Work Order:	NOKI0075
Serial Number:	L1242403137	Date:	2024-08-21
Customer:	Nokia Solutions and Networks	Temperature:	23.3°C
Attendees:	David Le, John Rattanavong	Relative Humidity:	52.1%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mbar
Tested By:	Jarrod Brenden	Job Site:	PT14
Power:	54VDC	Configuration:	NOKI0075-4

#### **TEST SPECIFICATIONS**

Specification:	Method:
FCC 27:2024	ANSI C63.26:2015

#### COMMENTS

All losses in the measurement path were accounted for in the reference level offset; attenuators, filters, cables, and DC blocks.

## DEVIATIONS FROM TEST STANDARD

#### CONCLUSION

Pass

Tested By

#### **TEST RESULTS**

	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Port 1	-	· ·		· ·	
QPSK Modulation					
Test Case 1					
NR20, Low Channel, 3710.01 MHz and	3699 MHz to 3701 MHz	3700	-34.101	-31.1	Pass
NR20, Low Channel 3730.02 MHz	3698 MHz to 3699 MHz	N/A	-32.68	-31.1	Pass
	3550 MHz to 3698 MHz	3698	-33.736	-31.1	Pass
Test Case 2					
NR20, High Channel 3949.98 MHz and	3979 MHz to 3981 MHz	3980	-35.465	-31.1	Pass
NR20, High Channel 3969.99 MHz	3981 MHz to 3982 MHz	N/A	-33.41	-31.1	Pass
	3982 MHz to 4130 MHz	3982	-33.466	-31.1	Pass
Test Case 3					
NR100, Low Channel 3750.00 MHz and	3699 MHz to 3700 MHz	N/A	-32.79	-31.1	Pass
NR100. Low Channel 3850.02 MHz	3698 MHz to 3699 MHz	N/A	-33.12	-31.1	Pass
	3550 MHz to 3698 MHz	3698	-33.037	-31.1	Pass
Test Case 4					
NR100, High Channel 3830.01 MHz and	3980 MHz to 3981 MHz	N/A	-32	-31.1	Pass
NR100, High Channel 3930.00 MHz	3981 MHz to 3982 MHz	N/A	-32.03	-31.1	Pass
	3982 MHz to 4130 MHz	3982.44	-32.102	-31.1	Pass
Test Case 5					
NR20, Low Channel 3710.01 MHz and	3699 MHz to 3701 MHz	3700	-36,125	-31.1	Pass
NR20, Low Channel, 3889.995 MHz	3698 MHz to 3699 MHz	N/A	-32.96	-31.1	Pass
	3550 MHz to 3698 MHz	3697.852	-34.142	-31.1	Pass

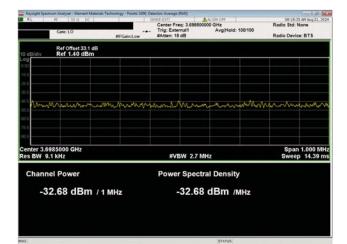


	Frequency Range	Frequency (MHz)	Value (dBm)	Limit (dBm)	Result
Test Case 6					
NR20, High Channel 3789.99 MHz and	3979 MHz to 3981 MHz	3980	-33.592	-31.1	Pass
NR20, High Channel 3969.99 MHz	3981 MHz to 3982 MHz	N/A	-31.87	-31.1	Pass
	3982 MHz to 4130 MHz	3982	-31.834	-31.1	Pass





Port 1 QPSK Modulation Test Case 1



Port 1 QPSK Modulation Test Case 1

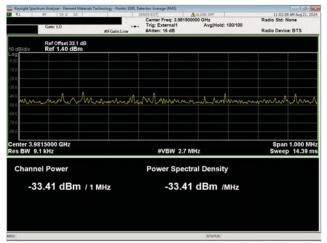
RL	RF 50 0 DC Gate: LO	PNO: Fast -+	Trig: External1 #Atten: 16 dB	#Avg Type: RMS Avg(Hold: 5/5		S AH Aug 21, 2024 RACE 1 2 3 4 5 TYPE A WARDOW DET A NININI
0 dB/div	Ref Offset 33.1 dB Ref 33.10 dBm				Mkr1 3.698 -33	000 GH
3.1						
3.1						
10						
90						
.9						
-						-
.9						
9						
	5000 GHz 1.0 MHz	#VB	W 3.0 MHz*		Stop 3 #Sweep 4.000	.69800 GH
2		STATUS			_	

Port 1 QPSK Modulation Test Case 1



Port 1 QPSK Modulation Test Case 2





Port 1 QPSK Modulation Test Case 2



Port 1 QPSK Modulation Test Case 2

Keysight Spectrum Analyzer - Element RL RF 50 Q DO			INSE EXT ALIG				AM Aug 21, 20.
Gate: LO	#FGain1.ow	•••	Center Freq: 3.699500000 G Trig: External1 #Atten: 16 dB	Hz Avg(Hold:	100/100	Radio Std: No Radio Device	100
Ref Offset 33. dBldiv Ref 1.40 dB		_					
5 6							
mmmm	www.www.w	wh	www.www.www.	www	Minu	whithi	mento
0 6							
enter 3.6995000 GHz es BW 9.1 kHz			#VBW 2.7 MHz				1.000 MH 14.39 m
Channel Power			Power Spectral	Density	'		
-32.79 dBn	1 / 1 MHz	-32.79 dBm /мнz					
3				STATUS			
			Port 1				

Port 1 QPSK Modulation Test Case 3

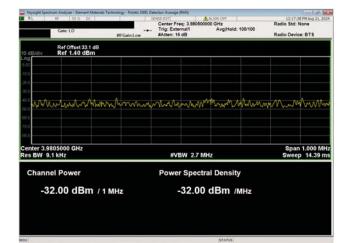
RL RF 59 R DC	Center Freq: 3.698500000 GHz			11:47:40 MH Aug 21, 20 Radio Std: None
Gate: LO	#FGainLow	. Trig: External1 #Atten: 16 dB	Avg[Hold: 100/100	Radio Device: BTS
Ref Offset 33.1 dB				
6				
www.homemann	Minhouse	monim	monument	man man
6				
5				
enter 3.6985000 GHz				Span 1.000 MH
es BW 9.1 kHz		#VBW 2.7	MHz	Sweep 14.39 m
Channel Power		Power Spec	tral Density	
-33.12 dBm /	1 MHz	-33.1		
			STATUS	
		Port 1		

Port 1 QPSK Modulation Test Case 3

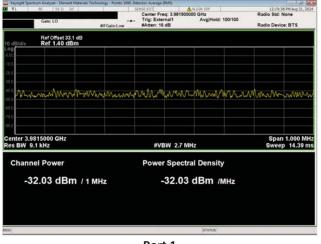


RL RF SER DC	PNO: Fast +++	Trig: External1	#Avg Type: RMS Avg[Hold: 5/5	11:49:28 AM Aug 21, 202 TRACE 12:34 TYPE A
Gene: LO	IFGain:Low	#Atten: 16 dB		DETANNSS
Ref Offset 33.1 dB dB/div Ref 33.10 dBm			M	kr1 3.698 000 GH: -33.037 dBn
£1				
1				
10				
.9				
9				
9				
9				
art 3.55000 GHz tes BW 1.0 MHz	#VBV	V 3.0 MHz*	#Sw	Stop 3.69800 GH
2			STATUS	

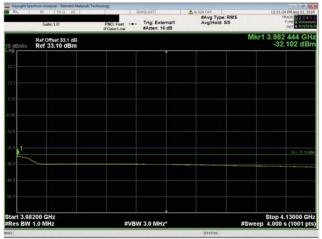
Port 1 QPSK Modulation Test Case 3



Port 1 QPSK Modulation Test Case 4



Port 1 QPSK Modulation Test Case 4

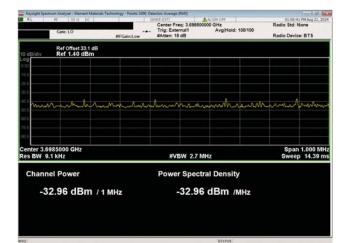


Port 1 QPSK Modulation Test Case 4





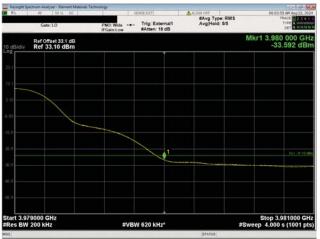
Port 1 QPSK Modulation Test Case 5



Port 1 QPSK Modulation Test Case 5

RL NF SKR DC Gete: LO	PNO: Fast Trig: External1 IFGainLow #Atten: 16 dB	#Avg Type: RMS Avg(Hold: 5/5	01:02:43 PM Aug 21, 202- TRACE 11 2:34 3 TYPE A WWWWW DET A N.N.N.N.N
Ref Offset 33.1 dB 0 dB/div Ref 33.10 dBm		M	kr1 3.697 852 GH: -34.142 dBn
5.1			
31			
10			
80			
1.0			
0.9			(DL 1-21-10-4
19			
6.9			
tart 3.55000 GHz			Stop 3.69800 GH; eep 4.000 s (1001 pts
Res BW 1.0 MHz	#VBW 3.0 MHz*	#Sw	eep 4.000 s (1001 pts

Port 1 QPSK Modulation Test Case 5



Port 1 QPSK Modulation Test Case 6



