



XMI 2022.12.28.0

OUTPUT POWER - BAND 66 LTE

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets.


The method in section 5.2.4.4 of ANSI C63.26 was used to make the measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement, a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

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

OUTPUT POWER - BAND 66 LTE



TbTx 2022.05.02.0 XMit 2022.12.28.0

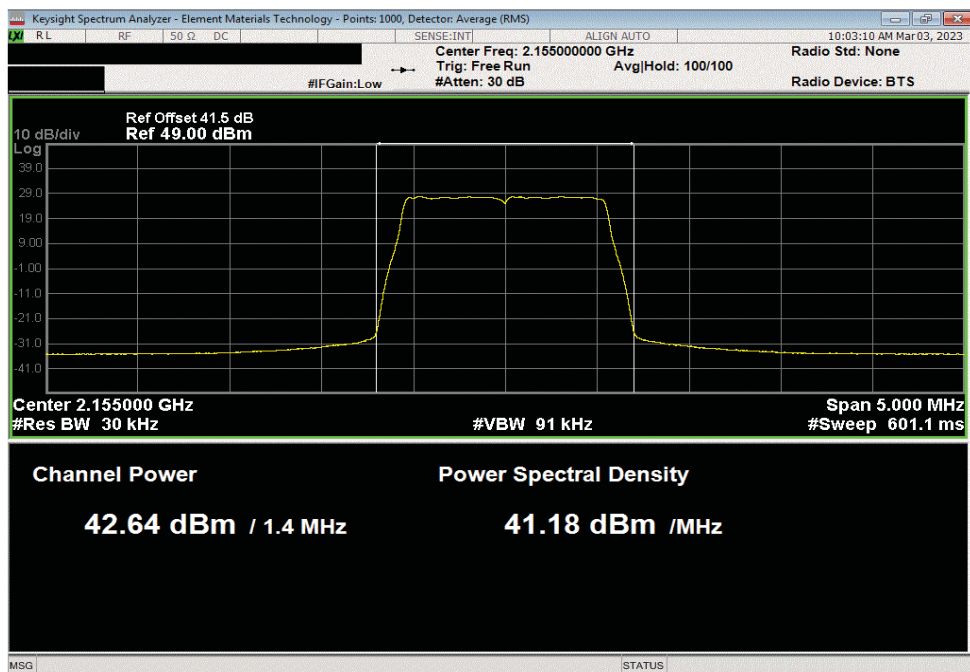
EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054	
Serial Number: BL2235N41PG		Date: 03/03/2023	
Customer: Nokia of America Corporation		Temperature: 24.8°C	
Attendees: John Rattanavong, David Le		Humidity: 36%	
Project: None		Barometric Pres.: 983.7 mbar	
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC	Job Site: TX07
TEST SPECIFICATIONS		Test Method	
FCC 27:2023		ANSI C63.26:2015	
RSS-139 Issue 4:2022		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carriers are enabled at 20 watts/carrier. The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidth on port 1. The total output power for multipoint (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 dB [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)].			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	
		Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)
		Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW
			Four Port (4x4 MIMO) dBm/Carrier BW
Band 66 2110 MHz - 2200 MHz, LTE			
Port 1			
1.4 MHz Bandwidth			
QPSK Modulation			
	Mid Channel 2155 MHz	42.639	0
		42.6	45.6
			48.6
16-QAM Modulation			
	Mid Channel 2155 MHz	42.629	0
		42.6	45.6
			48.6
64-QAM Modulation			
	Mid Channel 2155 MHz	42.593	0
		42.6	45.6
			48.6
256-QAM Modulation			
	Low Channel 2110.7 MHz	42.546	0
	Mid Channel 2155 MHz	42.602	0
	High Channel 2199.3 MHz	42.705	0
		42.7	45.7
			48.7

OUTPUT POWER - BAND 66 LTE

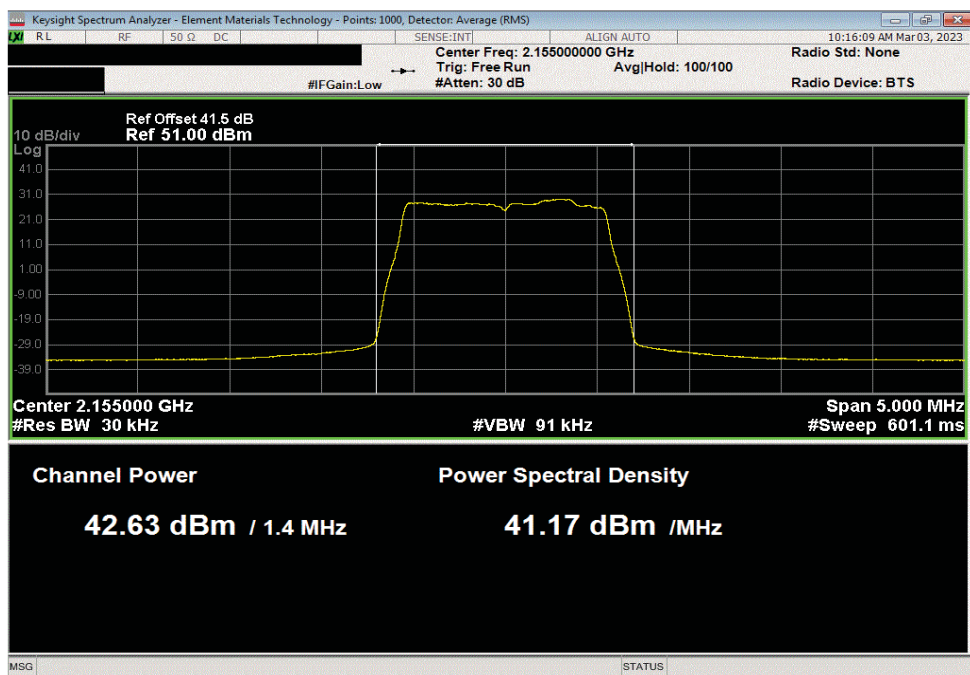


TbTx 2022.05.02.0 XMI 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.639	0	42.639	45.639	48.639	



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.629	0	42.629	45.629	48.629	

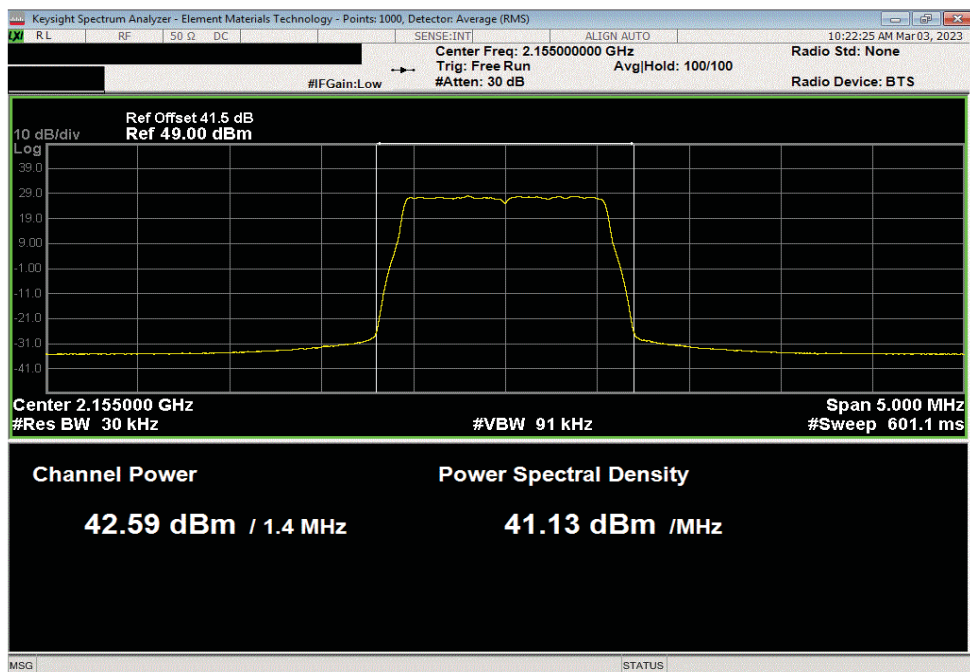


OUTPUT POWER - BAND 66 LTE

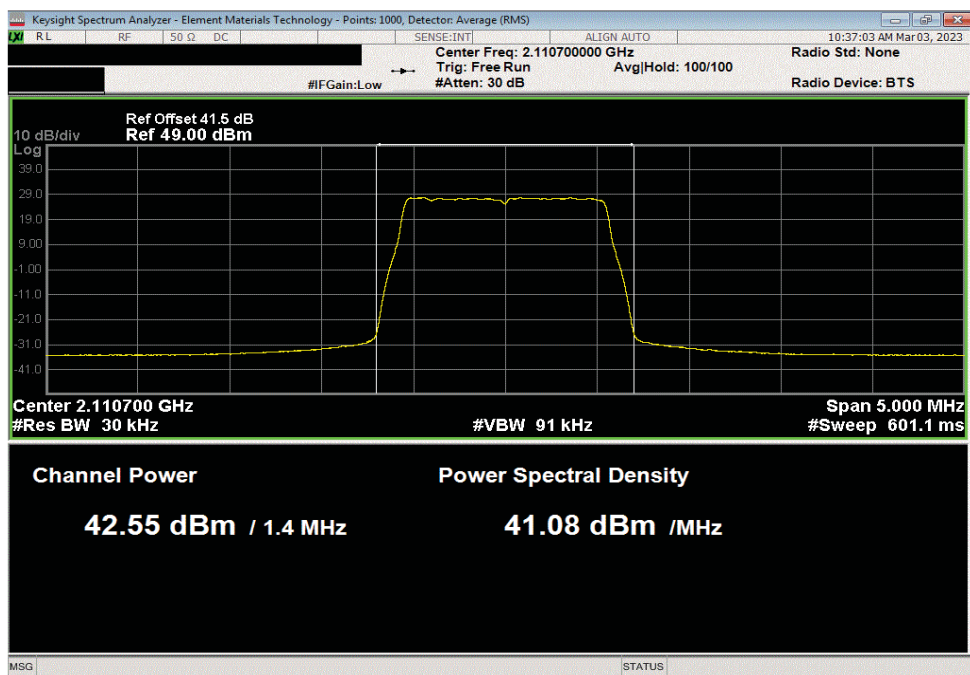


TbTx 2022.05.02.0 XbM 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.593	0	42.593	45.593	48.593	



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 2110.7 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.546	0	42.546	45.546	48.546	

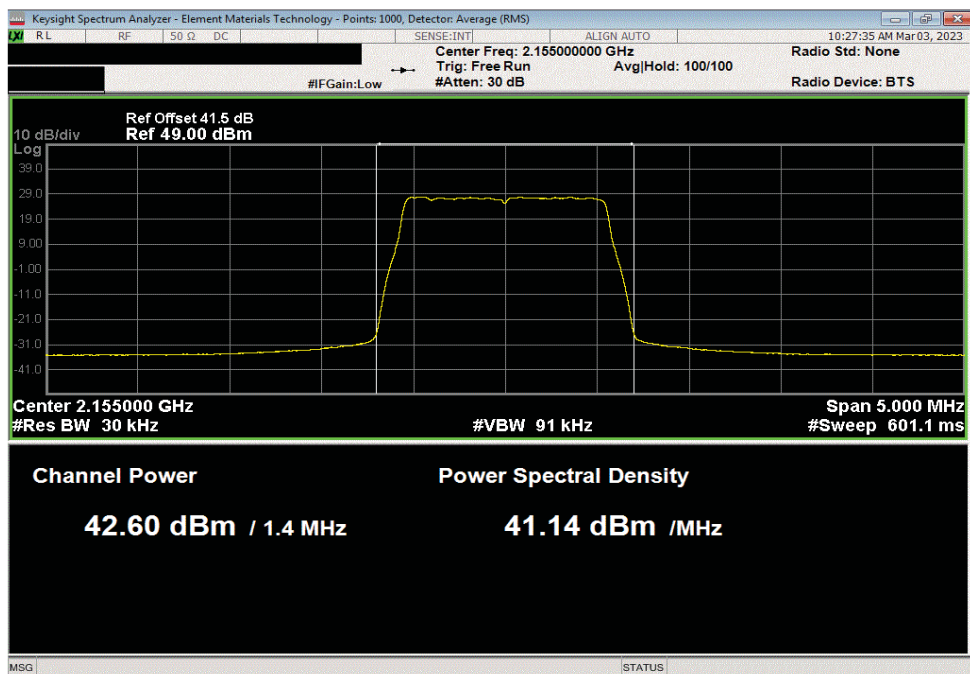


OUTPUT POWER - BAND 66 LTE

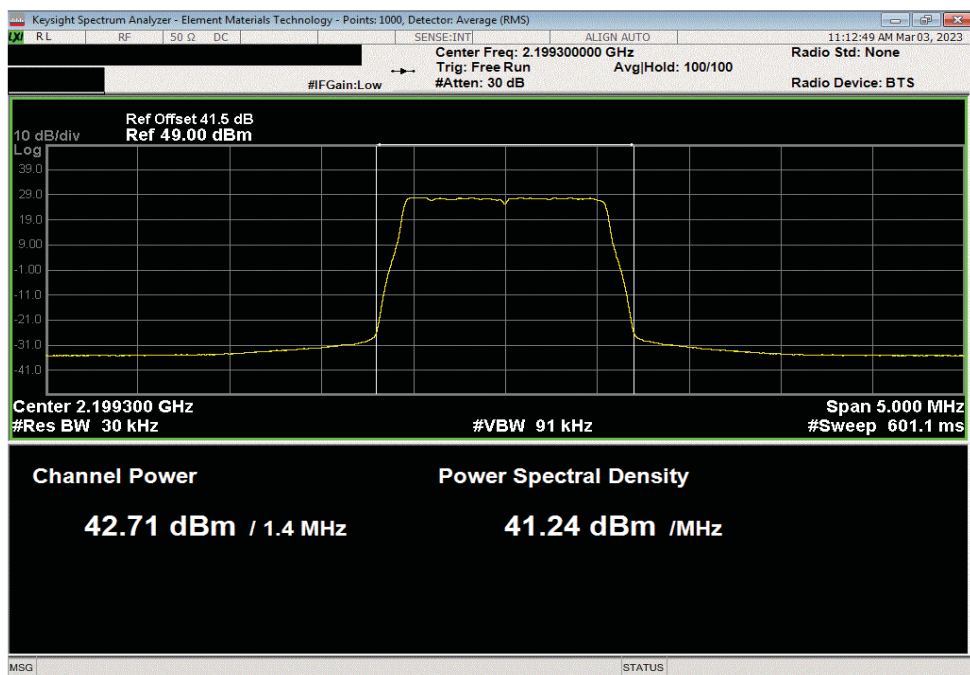


TMTx 2022.05.02.0 XMT 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.602	0	42.602	45.602	48.602	



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 2199.3 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.705	0	42.705	45.705	48.705	





XMI 2022.12.28.0

OUTPUT POWER - BAND 66 NB-IoT-SA

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

The fundamental emission output power (maximum average conducted output power) was measured using the channels and modes as called out on the following data sheets. The transmit power was set to its default maximum.

The method in section 5.2.4.4 of ANSI C63.26 was used to make the measurements. This method uses trace averaging across the ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1/D)]$, where D is the duty cycle in decimal, to the measured power to compute the average power during the actual transmission times


RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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 total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - BAND 66 NB-IoT-SA



TbTx 2022.05.02.0 XM 2022.12.28.0

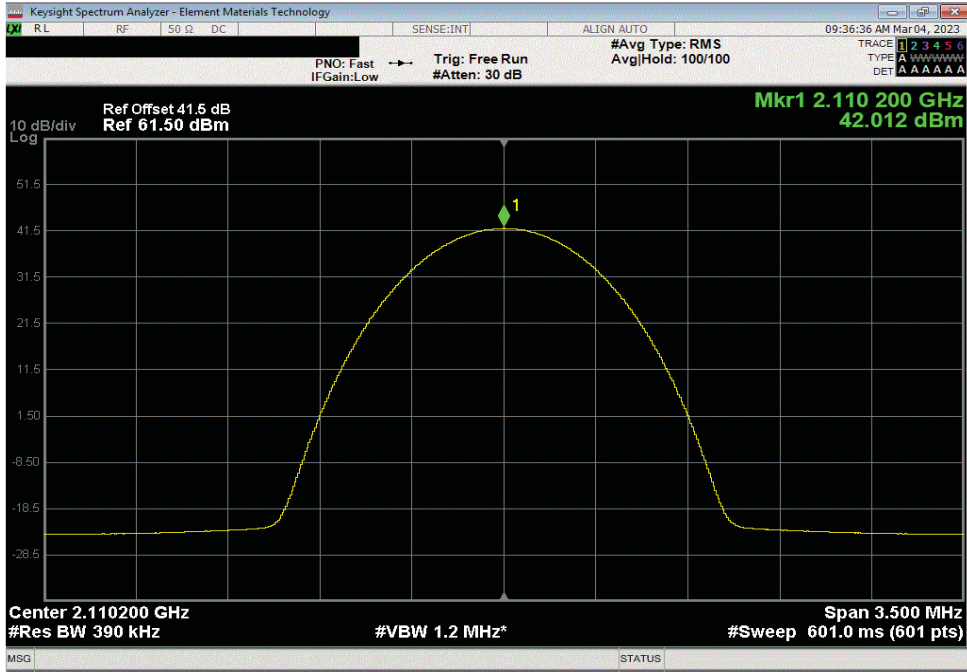
EUT: Aircscale Base Transceiver Station Remote Radio Head Model AHFI		Work Order: NOKI0054	
Serial Number: BL2235N41PG		Date: 03/03/2023	
Customer: Nokia of America Corporation		Temperature: 27°C	
Attendees: John Rattanavong, David Le		Humidity: 29.9%	
Project: None		Barometric Pres.: 984 mbar	
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC	
Job Site: TX07			
TEST SPECIFICATIONS		Test Method	
FCC 27:2023		ANSI C63.26:2015	
RSS-139 Issue 4:2022		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The NB IoT SA carriers are enabled at maximum power (20 watts/carrier). The following is the output power measurements at the radio output ports. The output power was measured for a single carrier over the carrier channel bandwidth on port 1. The total output power for multiport (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI C63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log Nout) The total output power for two port operation is the single port power +3 dB [i.e. 10*log(2)]. The total power for four port operations is single port power +6 dB [i.e. 10*log(4)]. The NB IoT SA carrier power level was reduced from maximum (20 watts/carrier) to meet the 62.15 and 62 dBm/MHz EIRP limits.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	
		Initial Value dBm/MHz	Duty Cycle Factor (dB)
		Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW
		Four Port (4x4 MIMO) dBm/Carrier BW	
Band 66 2110 MHz - 2200 MHz, NB-IoT			
Port 1			
200 KHz Bandwidth			
NTM Modulation			
	Low Channel 2110.2 MHz	42.012	0
	Mid Channel 2155 MHz	42.060	0
	High Channel 2199.8 MHz	42.218	0
		42.0	45.0
		42.1	45.1
		42.2	45.2
Band 66 2110 MHz - 2200 MHz, NB-IoT - Reduced Power			
Port 1			
200 KHz Bandwidth			
NTM Modulation			
	High Channel 2199.8 MHz	41.314	0
		41.3	44.3
			47.3

OUTPUT POWER - BAND 66 NB-IoT-SA

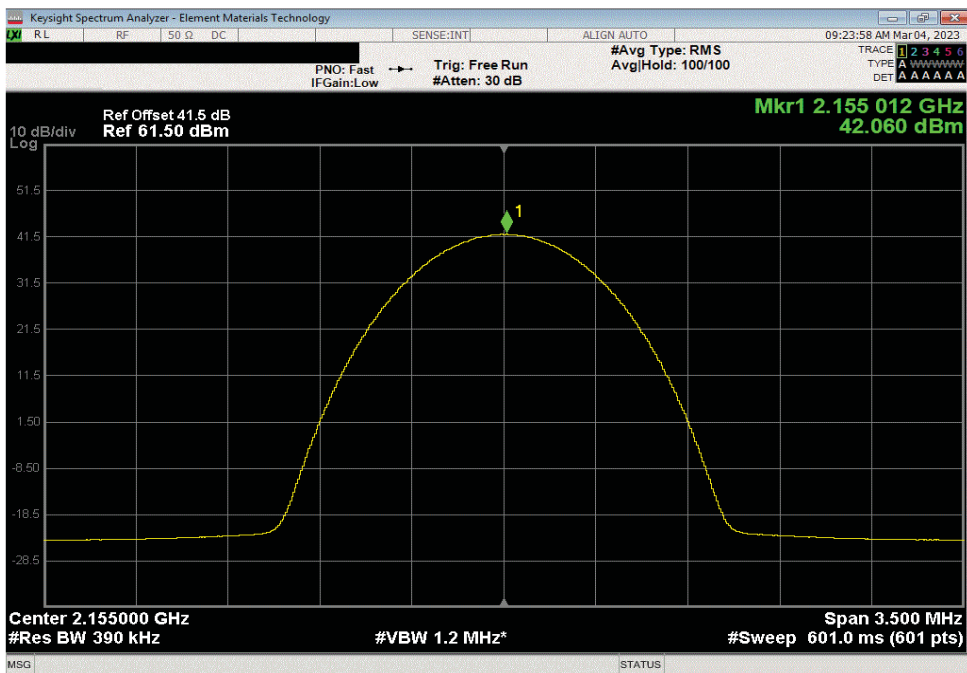


TbTfx 2022.05.02.0 XMI 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 2110.2 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
42.012	0	42.012	45.012	48.012		



Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 2155 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
42.06	0	42.06	45.06	48.06		

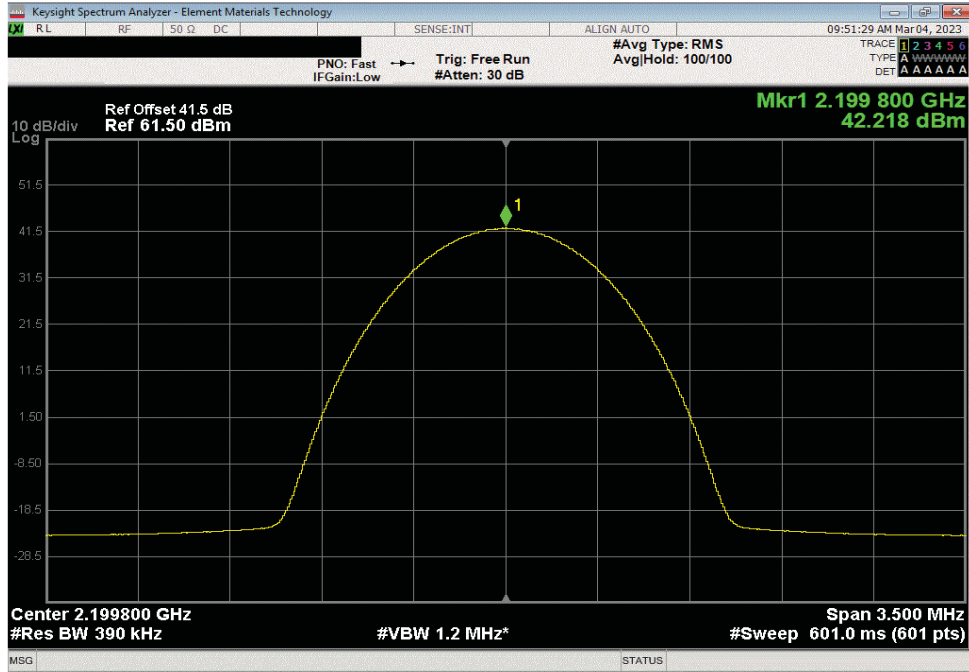


OUTPUT POWER - BAND 66 NB-IoT-SA

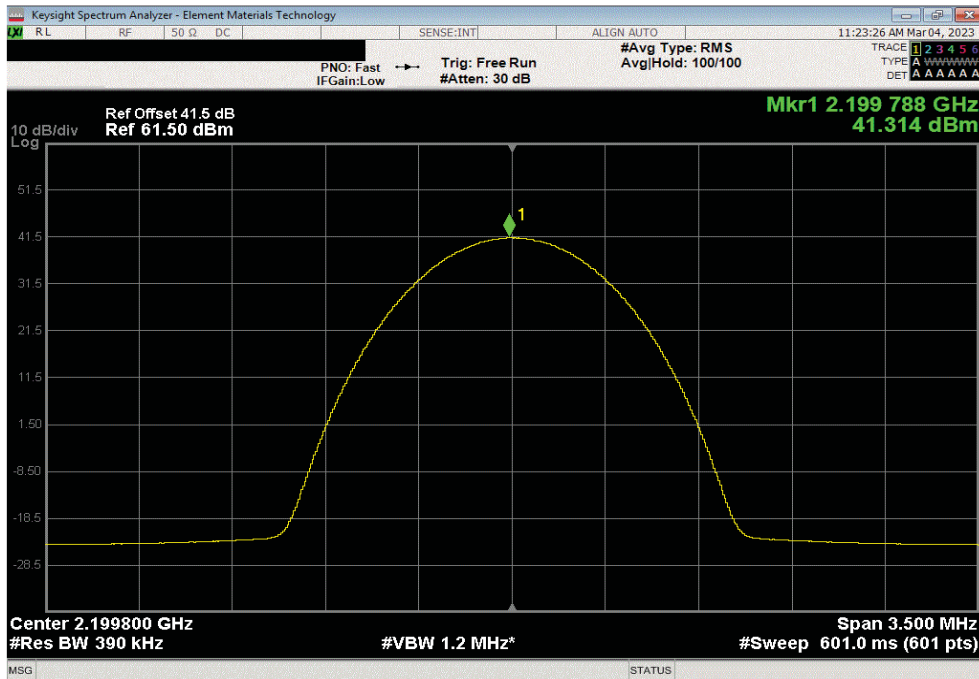


TbTfx 2022.05.02.0 XMR 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 2199.8 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
42.218	0	42.218	45.218	48.218	



Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 2199.8 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
41.314	0	41.314	44.314	47.314	



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n25 5G



XMIT 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.
The PAPR was measured using the CCDF function of the spectrum analyzer.


Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n25 5G



TbTx 2022.05.02.0 XMI 2022.12.28.0

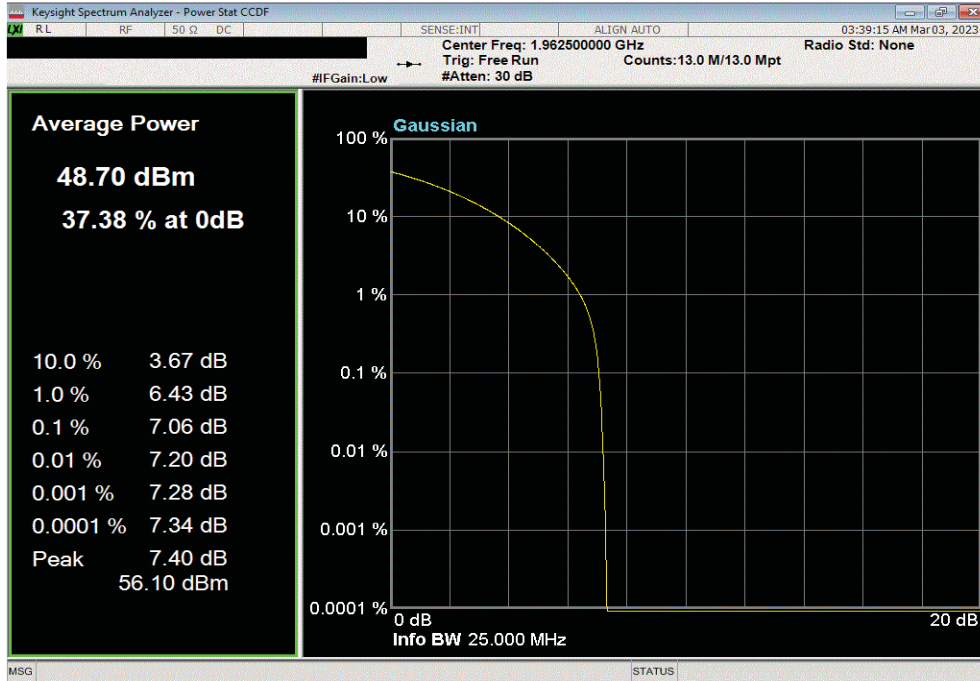
EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054	
Serial Number: BL2235N41PG	Customer: Nokia of America Corporation		Date: 03/02/2023
Attendees: David Le,	Project: None		Temperature: 23.6°C
Tested by: Brandon Hobbs and Jarrod Brenden	Power: 54 VDC	Humidity: 42.3%	Barometric Pres.: 977.3 mbar
TEST SPECIFICATIONS		Job Site: TX07	
FCC 24E:2022		ANSI C63.26:2015	
RSS-133 Issue 6:2013+A1:2018		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n25 carriers are enabled as maximum power (80 watts/carrier).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	
		0.1% PAPR Value (dB)	PAPR Limit (dB) Results
Band n25 1930 MHz - 1995 MHz, 5G NR			
Port 1			
25 MHz Bandwidth			
QPSK Modulation			
	Mid Channel 1962.5 MHz	7.06	13 Pass
16-QAM Modulation			
	Mid Channel 1962.5 MHz	7.14	13 Pass
64-QAM Modulation			
	Mid Channel 1962.5 MHz	7.06	13 Pass
256-QAM Modulation			
	Low Channel 1942.5 MHz	7.62	13 Pass
	Mid Channel 1962.5 MHz	7.07	13 Pass
	High Channel 1982.5 MHz	7.43	13 Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n25 5G

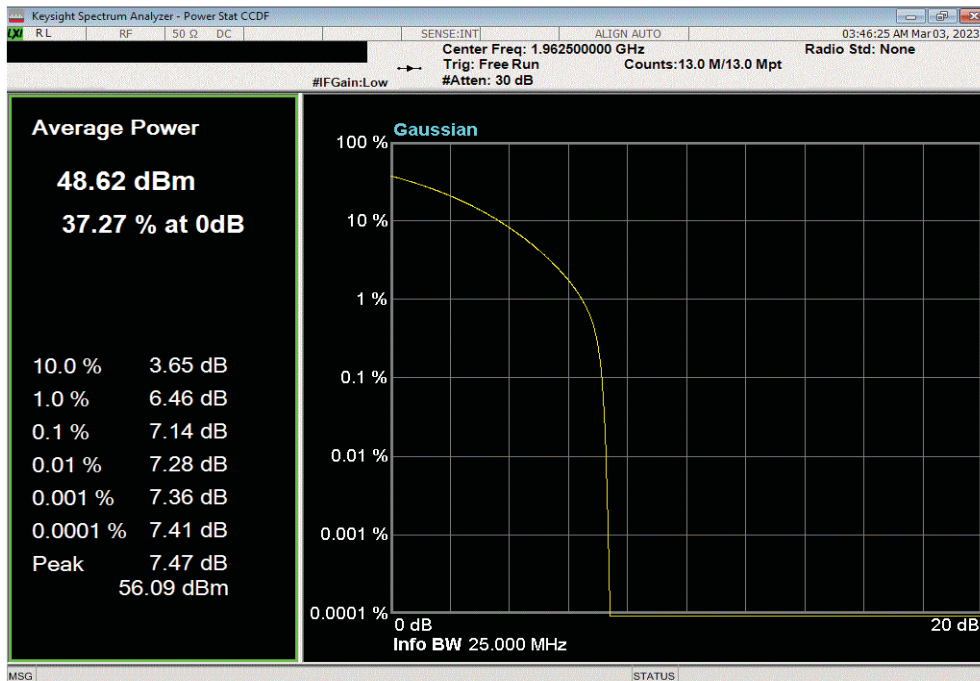


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.06	13	Pass		



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.14	13	Pass		

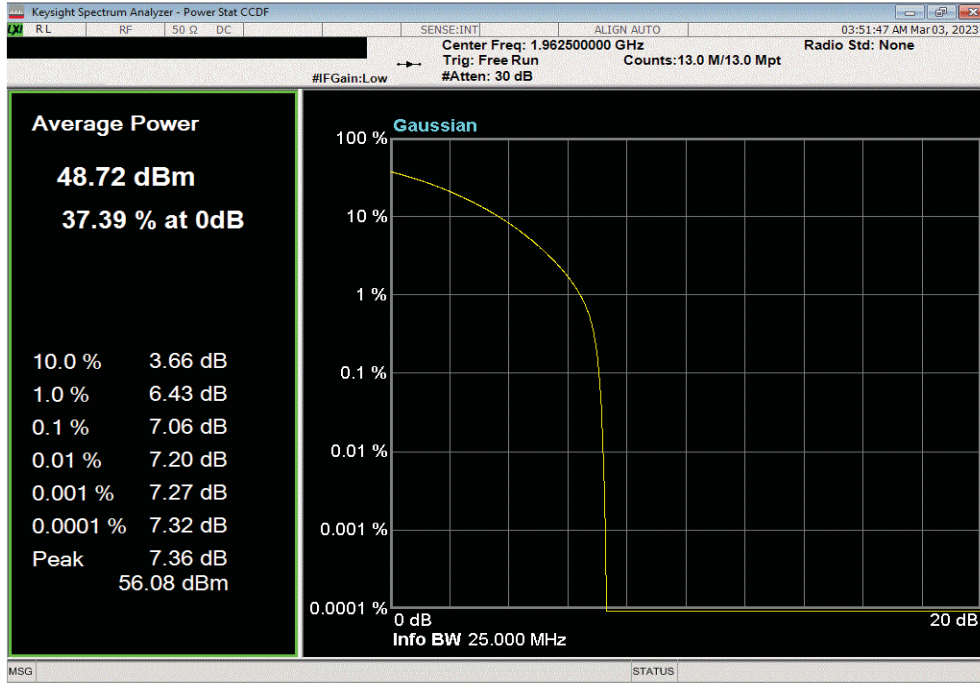


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n25 5G

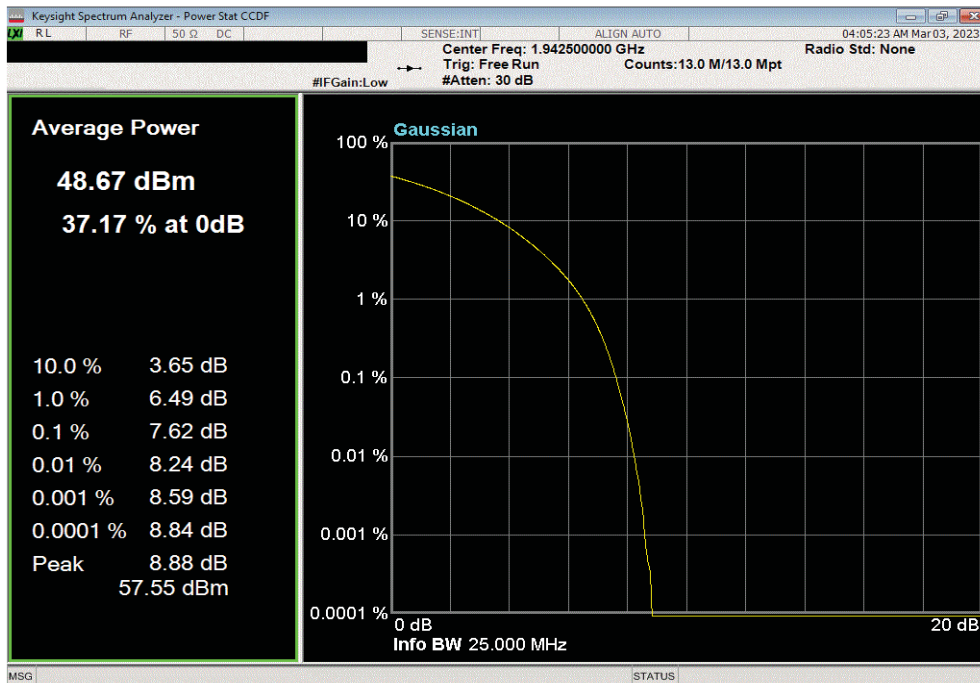


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.06	13	Pass		



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.62	13	Pass		

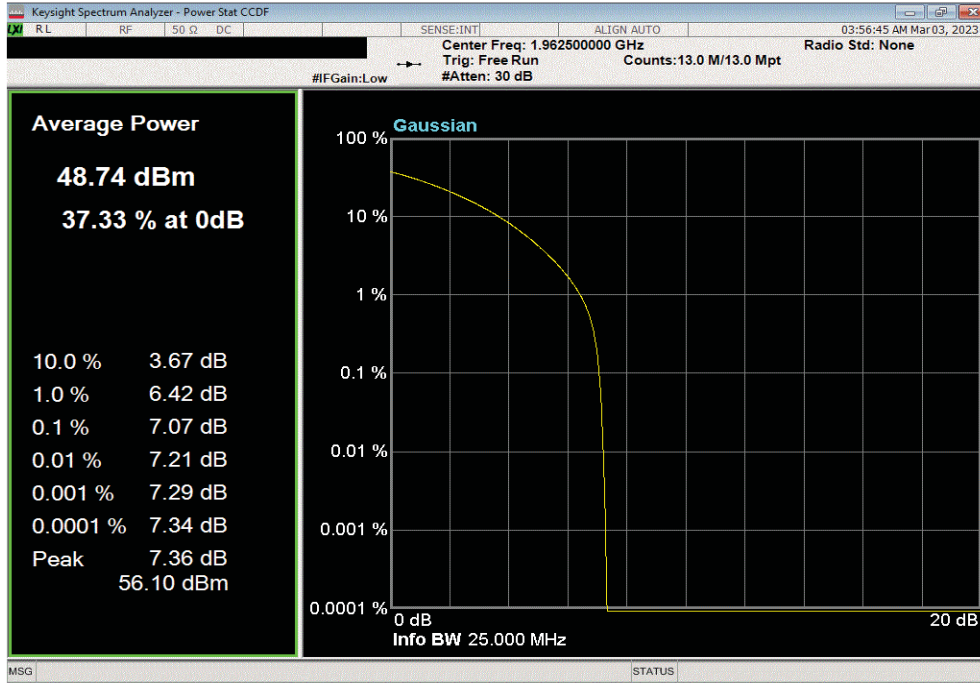


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n25 5G

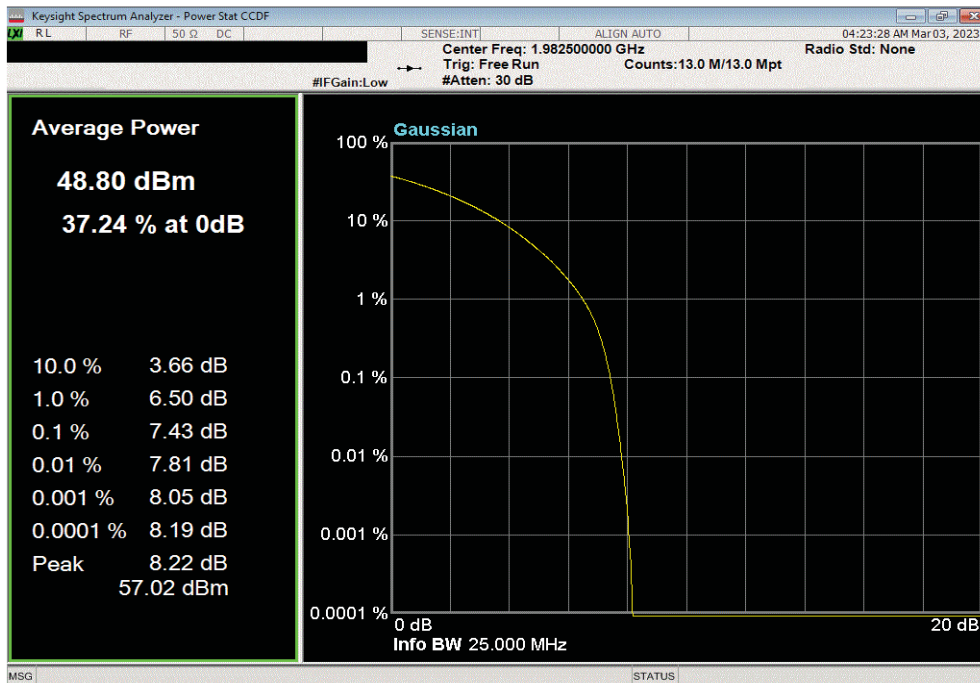


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR, Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
7.07	13	Pass				



Band n25 1930 MHz - 1995 MHz, 5G NR, Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
7.43	13	Pass				



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 LTE



XMI 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.
The PAPR was measured using the CCDF function of the spectrum analyzer.


Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 LTE



TbTx 2022.05.02.0 XMit 2022.12.28.0

EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054
Serial Number: BL2235N41PG		Date: 03/03/2023
Customer: Nokia of America Corporation		Temperature: 24°C
Attendees: John Rattanavong, David Le		Humidity: 37.9%
Project: None		Barometric Pres.: 983.9 mbar
Tested by: Brandon Hobbs and Jarrod Brenden	Power: 54 VDC	Job Site: TX07
TEST SPECIFICATIONS		
FCC 24E:2022		Test Method
RSS-133 Issue 6:2013+A1:2018		ANSI C63.26:2015
ANSI C63.26:2015		
COMMENTS		
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carriers are enabled at 20 watts/carrier.		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	NOKI0054-2	<i>Signature</i> 
		0.1% PAPR Value (dB) PAPR Limit (dB) Results

Band 25 1930 MHz - 1995 MHz, LTE
Port 1

1.4 MHz Bandwidth

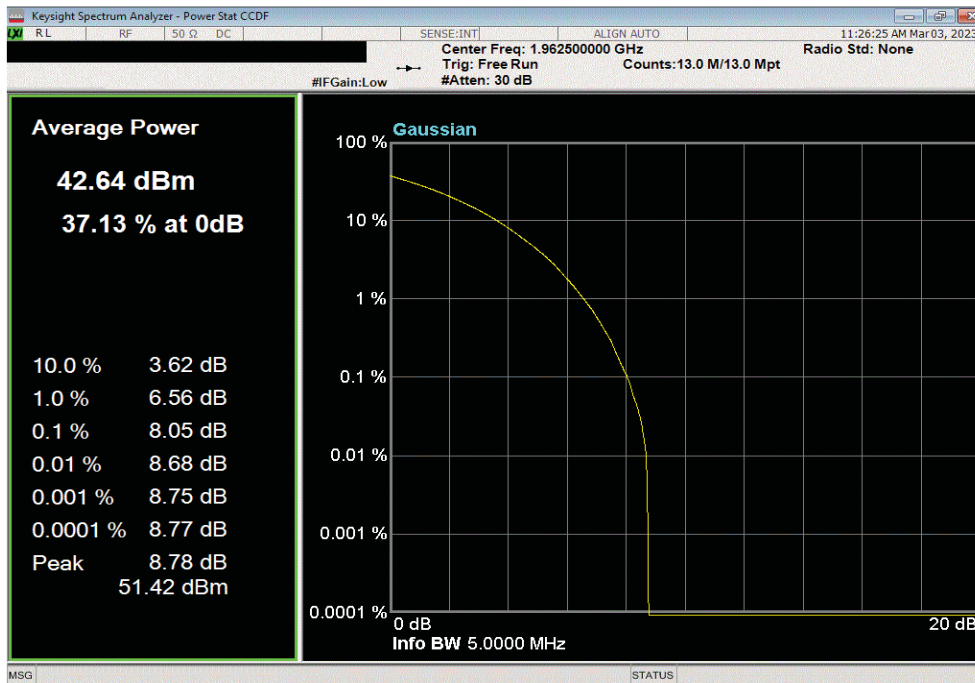
Modulation	Channel	0.1% PAPR Value (dB)	PAPR Limit (dB)	Results
QPSK Modulation	Mid Channel 1962.5 MHz	8.05	13	Pass
16-QAM Modulation	Mid Channel 1962.5 MHz	8.11	13	Pass
64-QAM Modulation	Mid Channel 1962.5 MHz	8.10	13	Pass
256-QAM Modulation	Low Channel 1930.7 MHz	8.08	13	Pass
	Mid Channel 1962.5 MHz	8.09	13	Pass
	High Channel 1989.3 MHz	8.08	13	Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 LTE

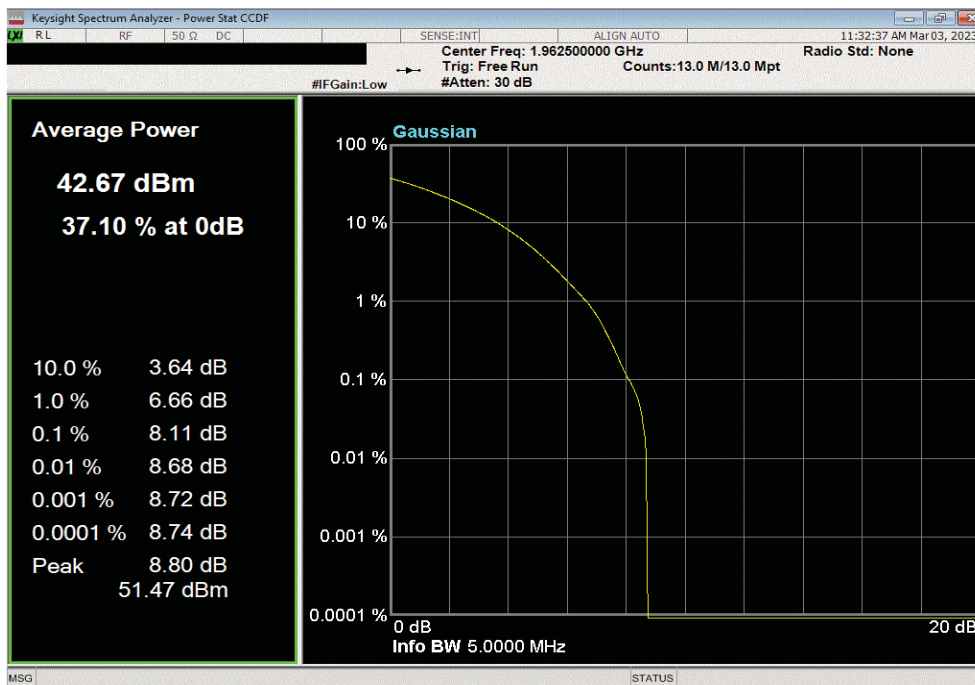


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 1962.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
8.05	13	Pass				



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 1962.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
8.11	13	Pass				

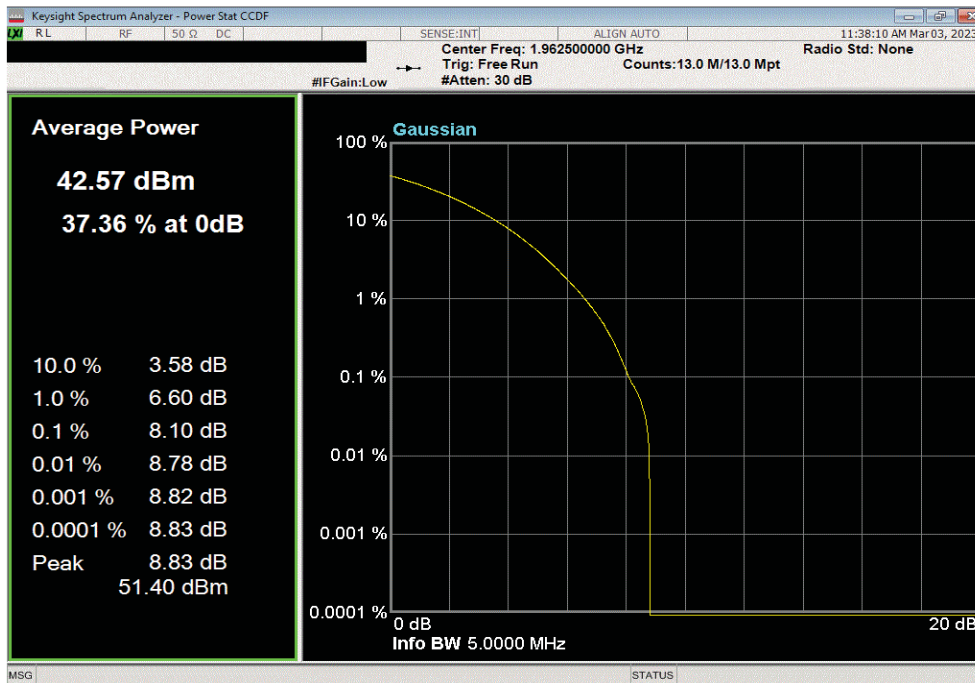


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 LTE

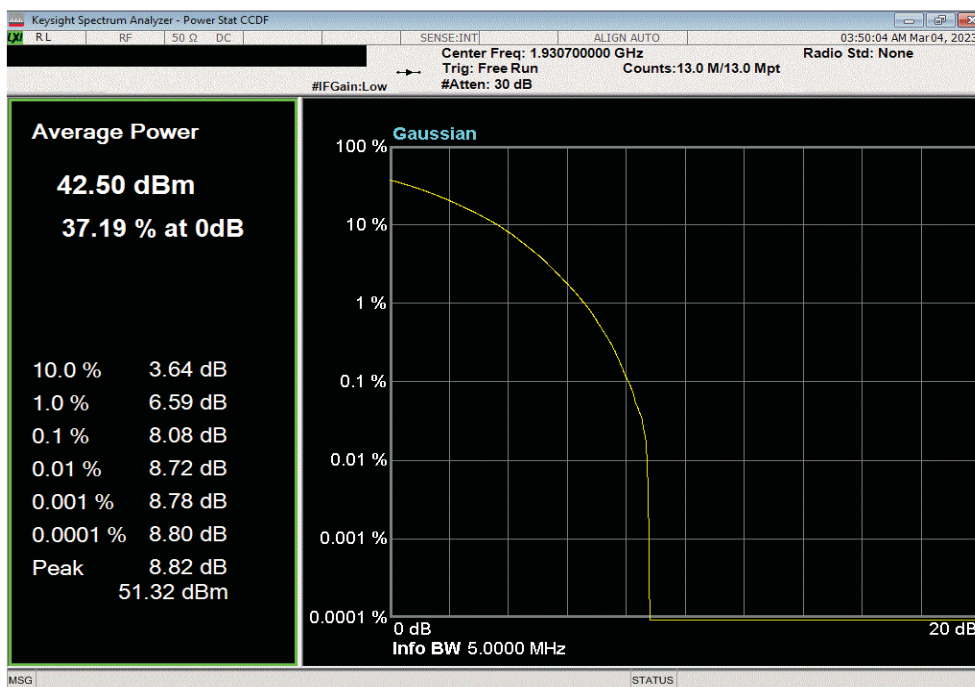


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 1962.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)		Limit (dB)				
8.1		13		Pass		



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)		Limit (dB)				
8.08		13		Pass		

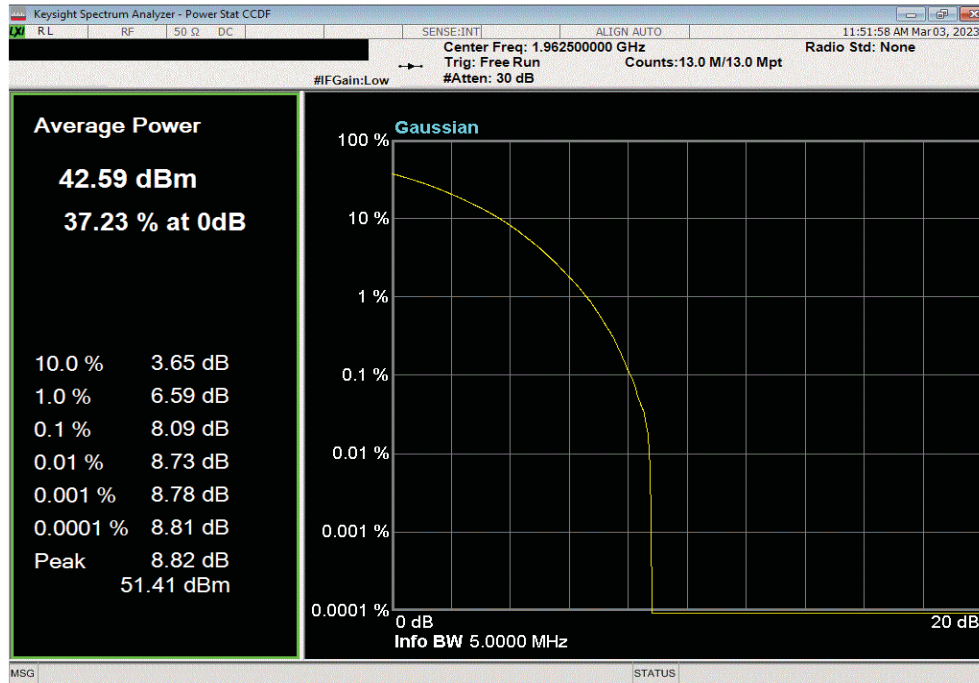


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 LTE

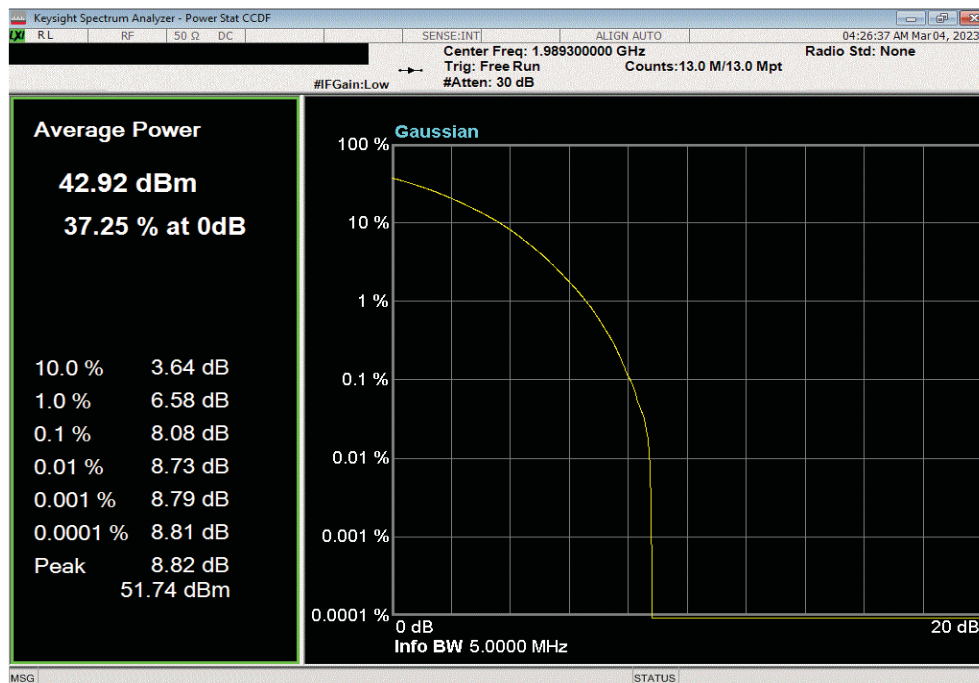


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 1962.5 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
8.09	13	Pass				



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
8.08	13	Pass				



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 NB-IoT-SA



XMI 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.
The PAPR was measured using the CCDF function of the spectrum analyzer.


Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

RF conducted emissions testing was performed only on one port. The testing was performed on the same version of hardware (AHFII) as the original certification test. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 NB-IoT-SA



TstTx 2022.05.02.0 XMI 2022.12.28.0

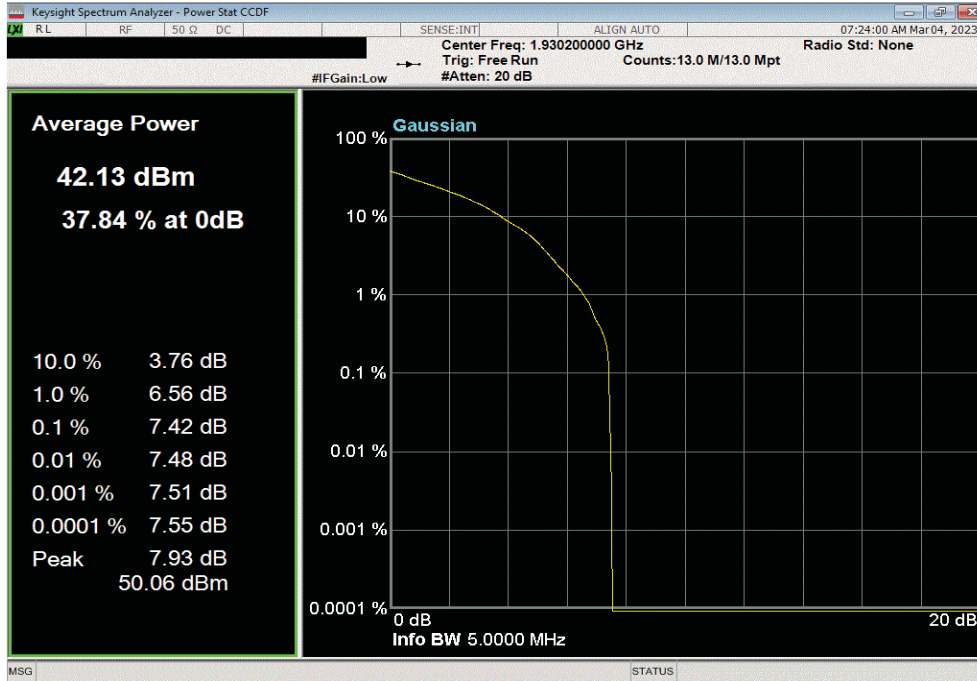
EUT: Aircscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054
Serial Number: BL2235N41PG		Date: 03/03/2023
Customer: Nokia of America Corporation		Temperature: 26.4°C
Attendees: John Rattanavong, David Le		Humidity: 31%
Project: None		Barometric Pres.: 983.8 mbar
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC
		Job Site: TX07
TEST SPECIFICATIONS		
FCC 24E:2022		ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018		ANSI C63.26:2015
COMMENTS		
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The NB IoT SA carriers are enabled at maximum power (20 watts/carrier).		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	NOKI0054-2	<i>Signature</i> 
		0.1% PAPR Value (dB) PAPR Limit (dB) Results
Band 25 1930 MHz - 1995 MHz, NB-IoT		
Port 1		
200 KHz Bandwidth		
NTM Modulation		
	Low Channel 1930.2 MHz	7.42 13 Pass
	Mid Channel 1962.5 MHz	7.33 13 Pass
	High Channel 1994.8 MHz	6.82 13 Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 NB-IoT-SA

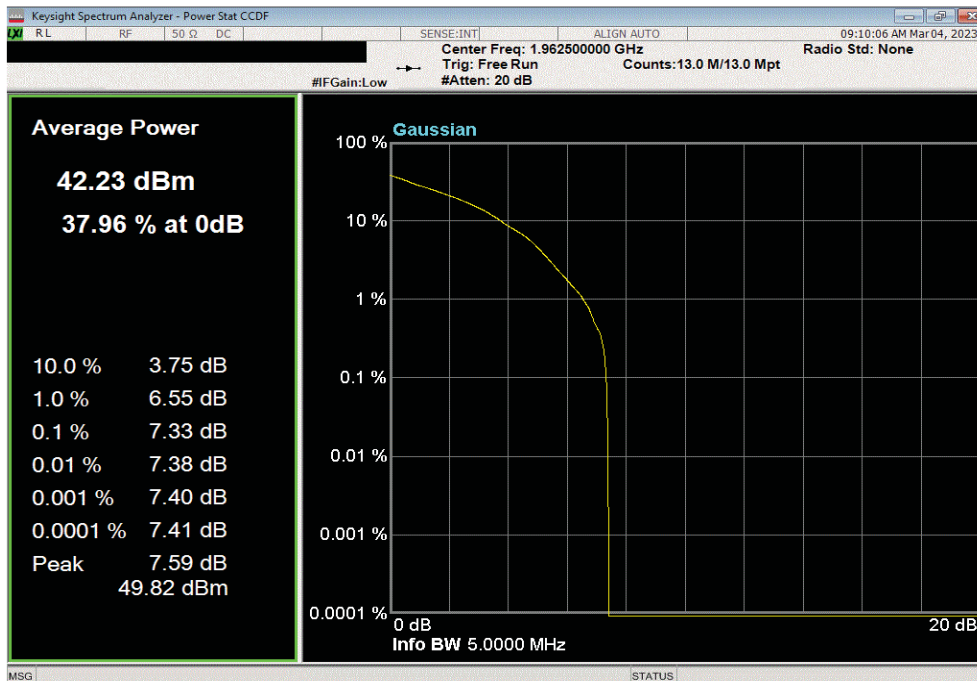


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.42	13	Pass		



Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 1962.5 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.33	13	Pass		

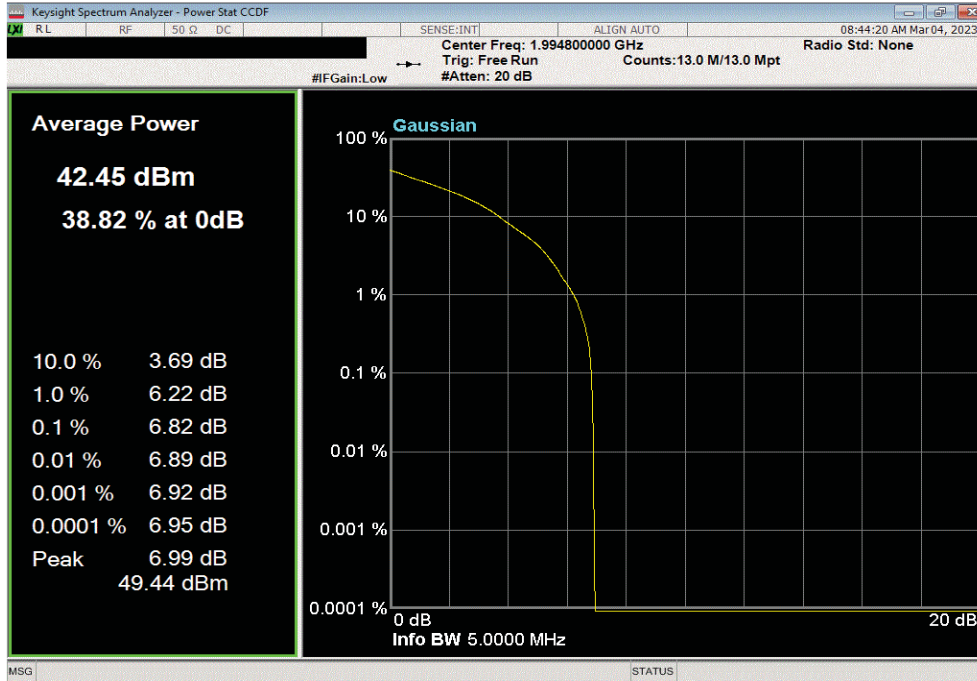


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 25 NB-IoT-SA



TxFx 2022.05.02.0 XMI 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
6.82	13	Pass				



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n66 5G



XMIT 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.

The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.

Per FCC part 27.50(d)(5) and RSS-139 6.5, the peak-to-average power ratio (PAPR) shall not exceed 13dB.

RF conducted emissions testing was performed only on one port. All four AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n66 5G



TMTx 2022.05.02.0 XMM 2022.12.28.0

EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054
Serial Number: BL2235N41PG		Date: 03/02/2023
Customer: Nokia of America Corporation		Temperature: 23.8°C
Attendees: John Rattanavong, David Le		Humidity: 41.8%
Project: None		Barometric Pres.: 977.6 mbar
Tested by: Brandon Hobbs and Jarrod Brenden	Power: 54 VDC	Job Site: TX07
TEST SPECIFICATIONS		Test Method
FCC 27:2023		ANSI C63.26:2015
RSS-139 Issue 4:2022		ANSI C63.26:2015
COMMENTS		
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n66 carriers are enabled as maximum power (80 watts/carrier).		
DEVIATIONS FROM TEST STANDARD		
None		
Configuration #	NOKI0054-2	Signature
		0.1% PAPR Value (dB)
		PAPR Limit (dB)
		Results

Band n66 2110 MHz - 2200 MHz, 5G NR

Port 1

25 MHz Bandwidth

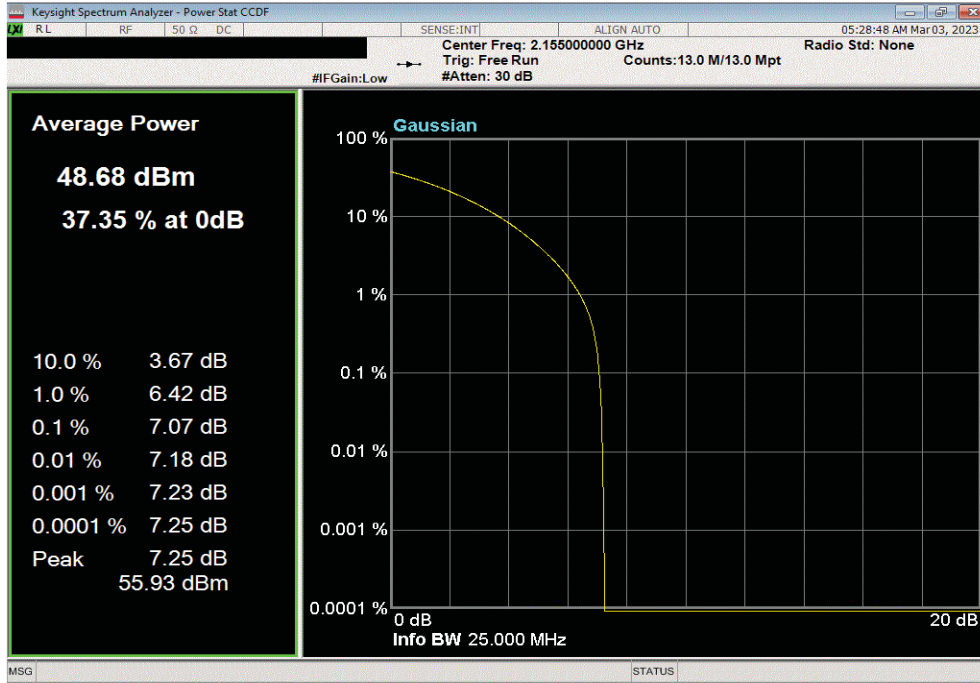
Modulation	Channel	0.1% PAPR Value (dB)	PAPR Limit (dB)	Results
QPSK Modulation	Mid Channel 2155 MHz	7.07	13	Pass
	Mid Channel 2155 MHz	7.14	13	Pass
16-QAM Modulation	Mid Channel 2155 MHz	7.07	13	Pass
	Mid Channel 2155 MHz	7.07	13	Pass
256-QAM Modulation	Low Channel 2122.5 MHz	7.18	13	Pass
	Mid Channel 2155 MHz	7.08	13	Pass
	High Channel 2187.5 MHz	7.16	13	Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n66 5G

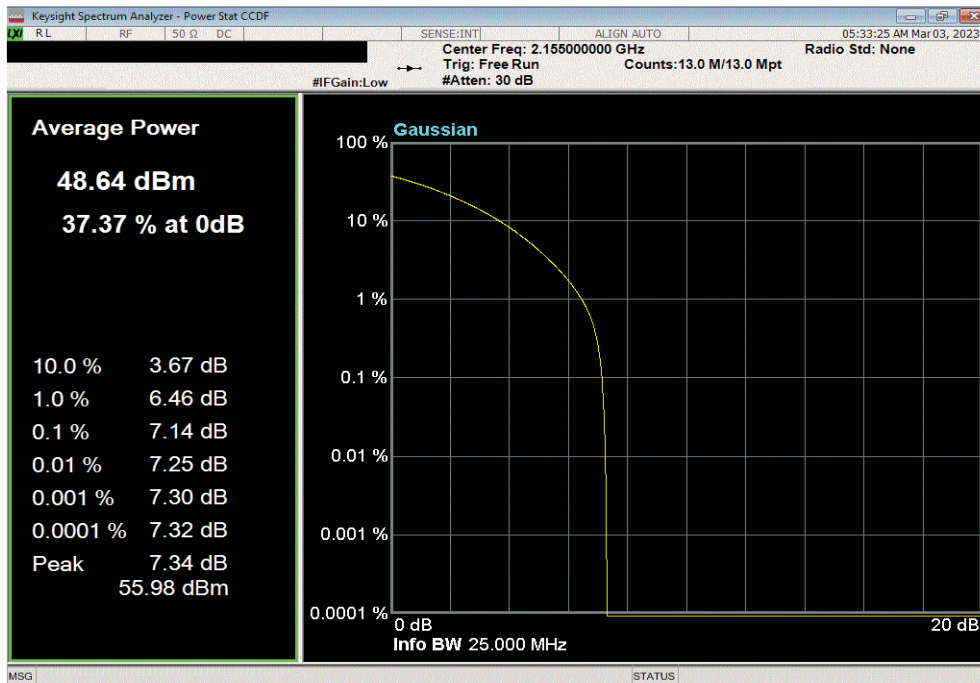


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
7.07	13	Pass				



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz						
0.1% PAPR		PAPR		Results		
Value (dB)	Limit (dB)					
7.14	13	Pass				

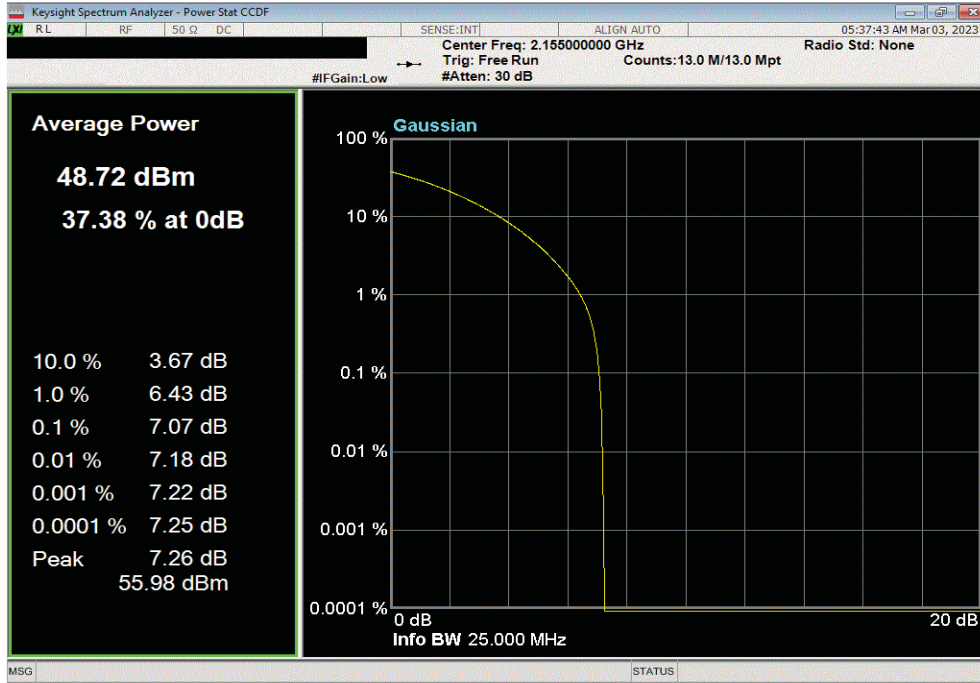


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n66 5G

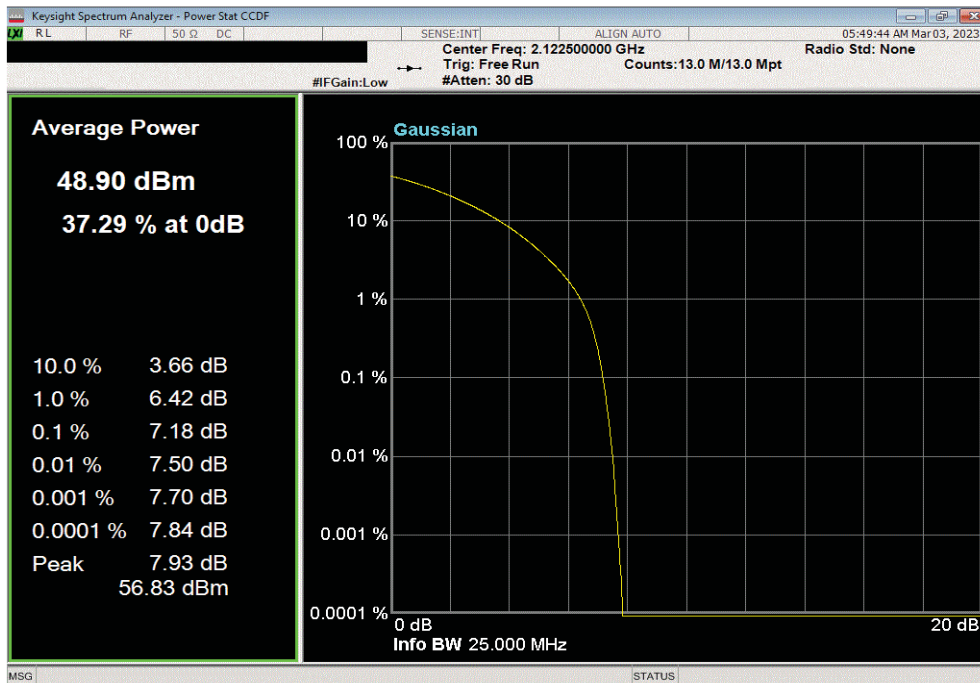


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.07	13	Pass		



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
		0.1% PAPR	PAPR			
		Value (dB)	Limit (dB)	Results		
		7.18	13	Pass		

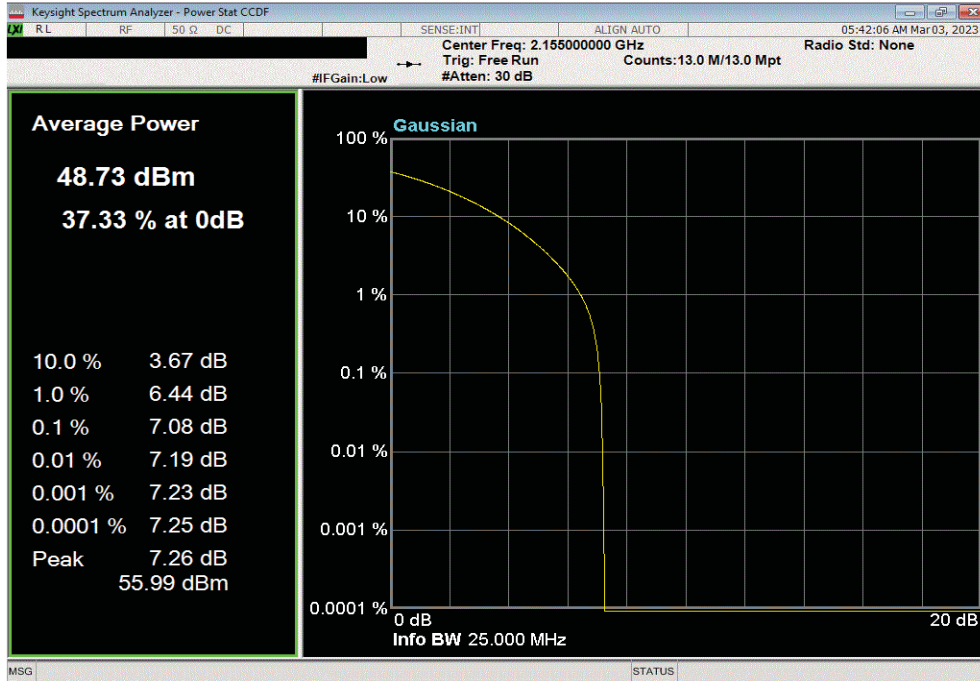


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n66 5G

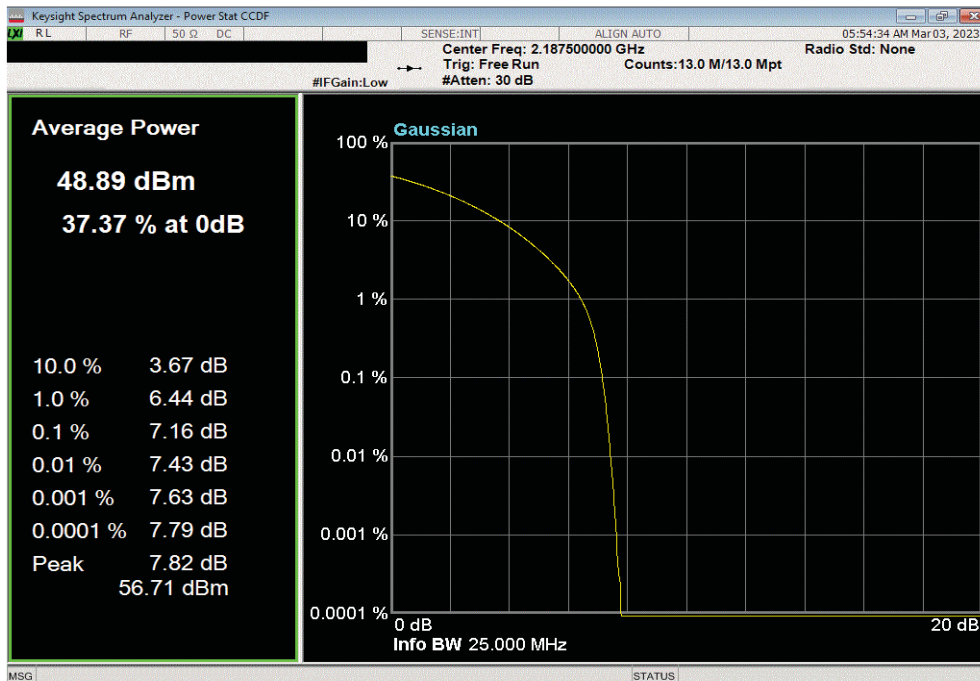


TotTx 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.08	13	Pass		



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.16	13	Pass		



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 LTE



XMI 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.

The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.


Per FCC part 27.50(d)(5) and RSS-139 6.5, the peak-to-average power ratio (PAPR) shall not exceed 13dB.

RF conducted emissions testing was performed only on one port. All four AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 LTE



TbTx 2022.05.02.0 XMt 2022.12.28.0

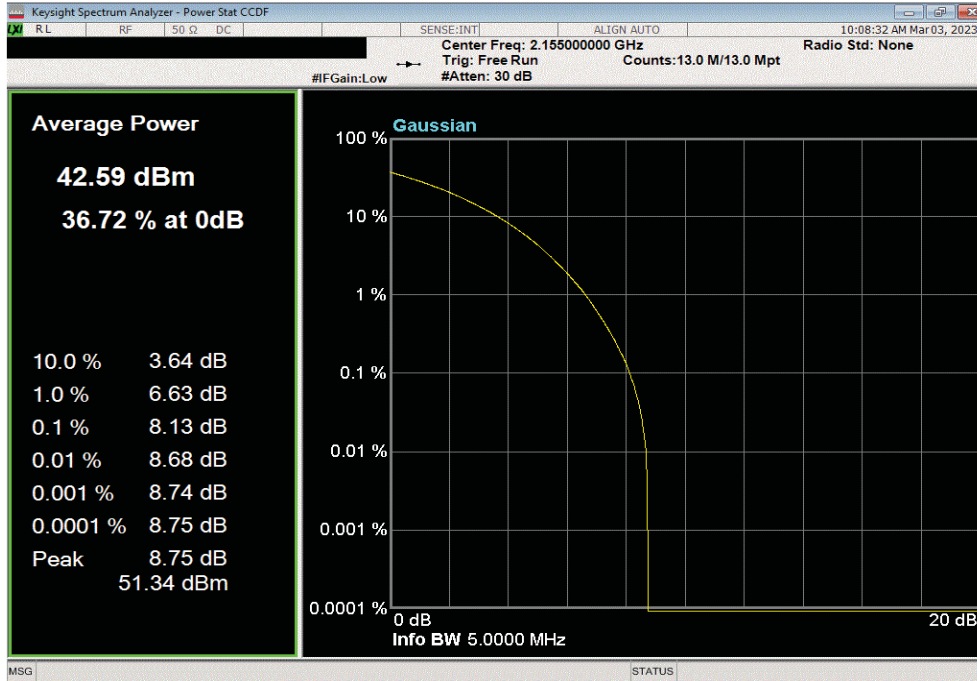
EUT: Aircscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054	
Serial Number: BL2235N41PG		Date: 03/03/2023	
Customer: Nokia of America Corporation		Temperature: 24.9°C	
Attendees: John Rattanavong, David Le		Humidity: 35.8%	
Project: None		Barometric Pres.: 983.6 mbar	
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC	
Job Site: TX07			
TEST SPECIFICATIONS		Test Method	
FCC 27:2023		ANSI C63.26:2015	
RSS-139 Issue 4:2022		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carriers are enabled at 20 watts/carrier.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	
		0.1% PAPR Value (dB)	PAPR Limit (dB) Results
Band 66 2110 MHz - 2200 MHz, LTE			
Port 1			
1.4 MHz Bandwidth			
QPSK Modulation			
	Mid Channel 2155 MHz	8.13	13 Pass
16-QAM Modulation			
	Mid Channel 2155 MHz	8.22	13 Pass
64-QAM Modulation			
	Mid Channel 2155 MHz	8.16	13 Pass
256-QAM Modulation			
	Low Channel 2110.7 MHz	8.08	13 Pass
	Mid Channel 2155 MHz	8.09	13 Pass
	High Channel 2199.3 MHz	8.08	13 Pass

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 LTE

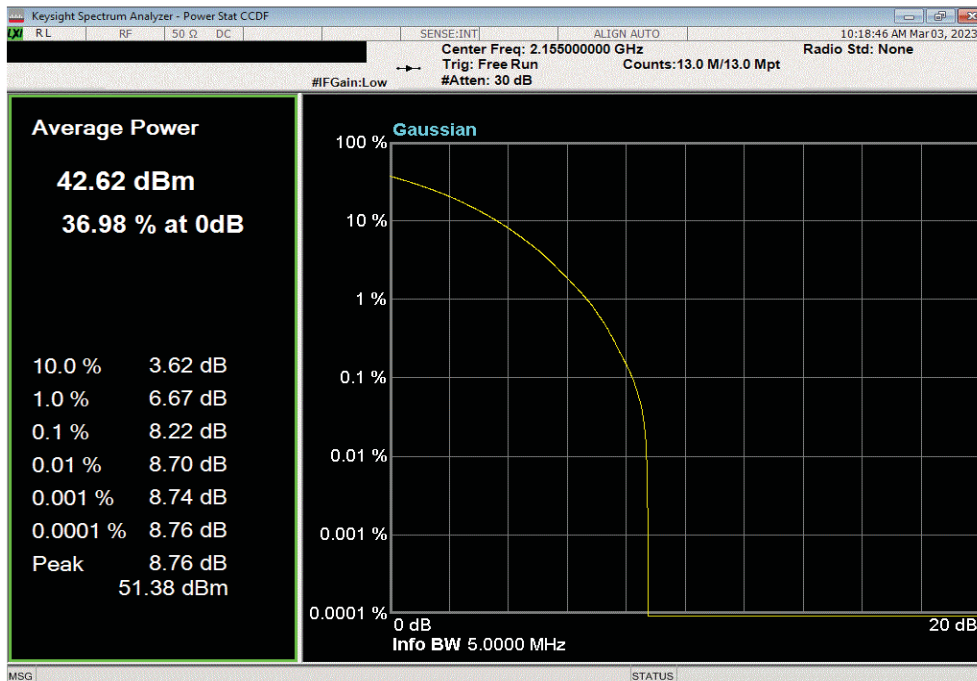


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, QPSK Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.13	13	Pass		



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 16-QAM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.22	13	Pass		

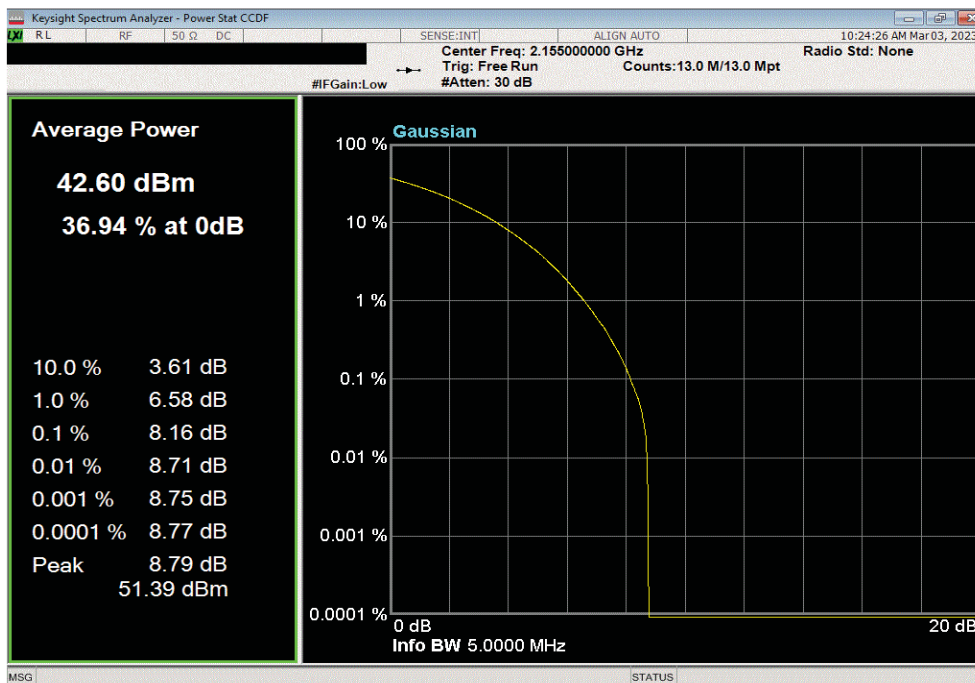


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 LTE

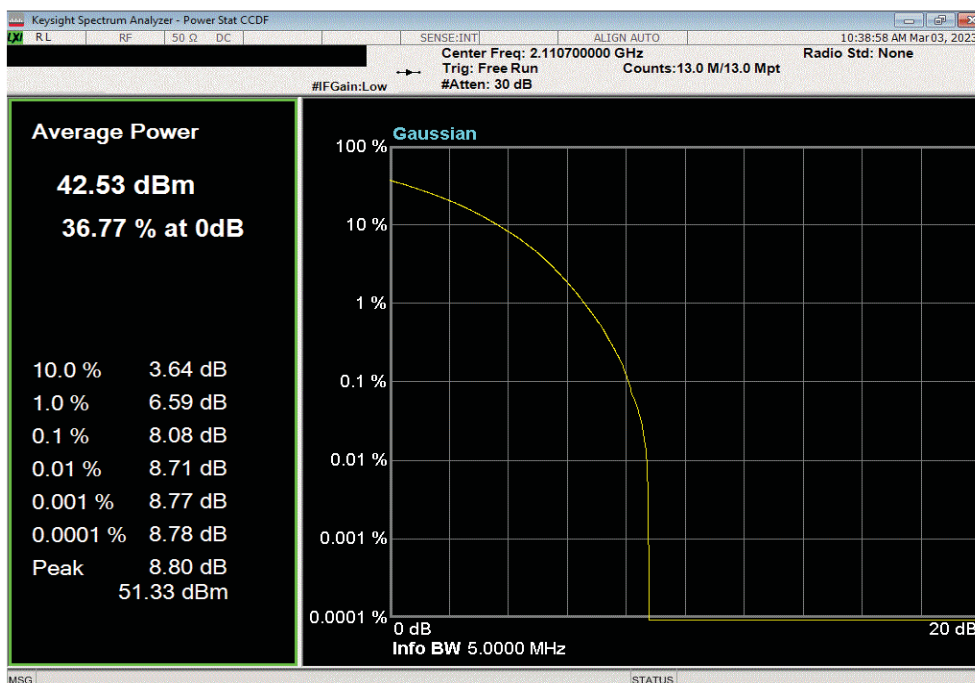


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 64-QAM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.16	13	Pass		



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 2110.7 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.08	13	Pass		

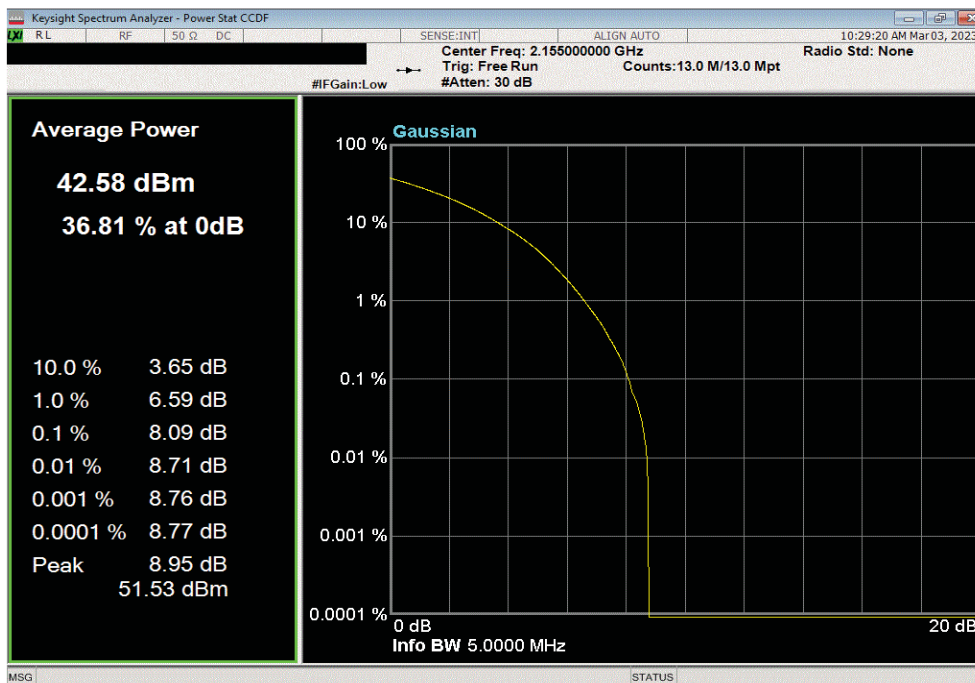


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 LTE

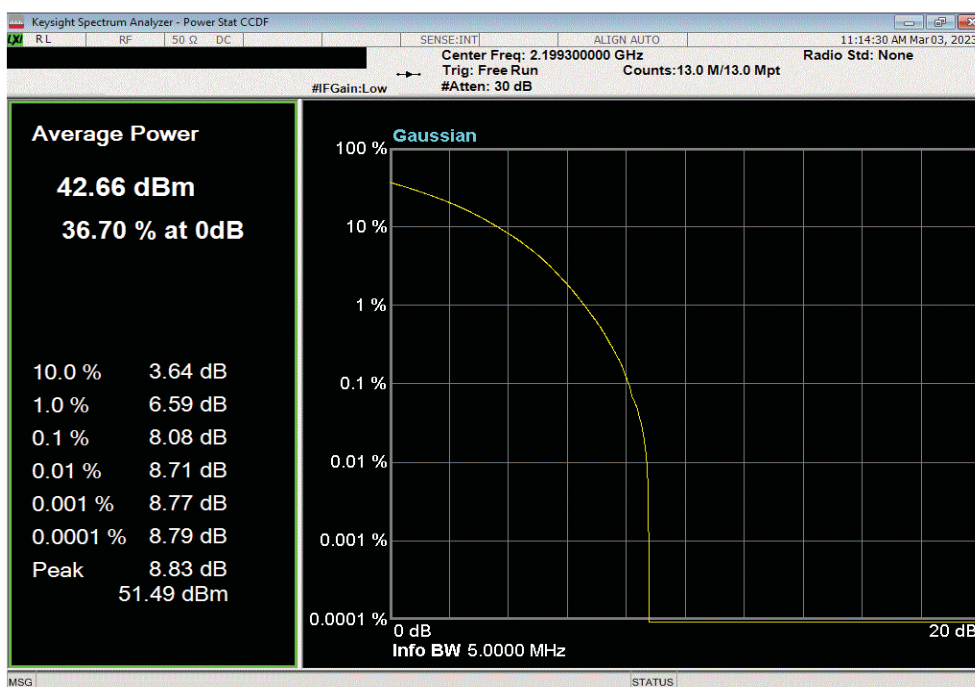


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.09	13	Pass		



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 2199.3 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		8.08	13	Pass		



PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 NB-IoT-SB



XMI 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed the rule part defined limit.

The PAPR measurement method is described in ANSI C63.26 section 5.2.3.4.

The PAPR was measured using the CCDF function of the spectrum analyzer.

Per FCC part 24.232(d) and RSS 133 6.4, the PAPR limit shall not exceed 13 dB for more than the ANSI described 0.1% of the time.


Per FCC part 27.50(d)(5) and RSS-139 6.5, the peak-to-average power ratio (PAPR) shall not exceed 13dB.

RF conducted emissions testing was performed only on one port. All four AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the original 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.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 NB-IoT-SB



TbTx 2022.05.02.0 XMit 2022.12.28.0

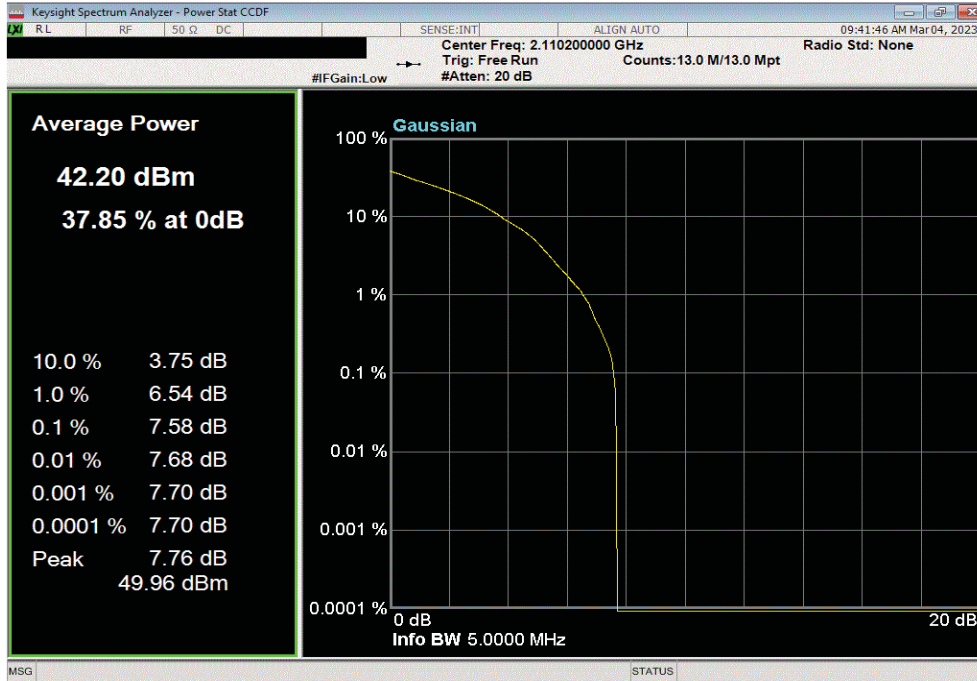
EUT: Aircscale Base Transceiver Station Remote Radio Head Model AHFI		Work Order: NOKI0054	
Serial Number: BL2235N41PG		Date: 03/03/2023	
Customer: Nokia of America Corporation		Temperature: 27°C	
Attendees: John Rattanavong, David Le		Humidity: 29.8%	
Project: None		Barometric Pres.: 984 mbar	
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC	
Job Site: TX07			
TEST SPECIFICATIONS			
FCC 27:2023		Test Method	
RSS-139 Issue 4:2022		ANSI C63.26:2015	
COMMENTS		ANSI C63.26:2015	
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The NB IoT SA carriers are enabled at maximum power (20 watts/carrier).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	
		0.1% PAPR Value (dB)	PAPR Limit (dB) Results
Band 66 2110 MHz - 2200 MHz, NB-IoT			
Port 1			
200 KHz Bandwidth			
NTM Modulation			
Low Channel 2110.2 MHz		7.58	13 N/A
Mid Channel 2155 MHz		7.58	13 N/A
High Channel 2199.8 MHz		7.59	13 N/A

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 NB-IoT-SB

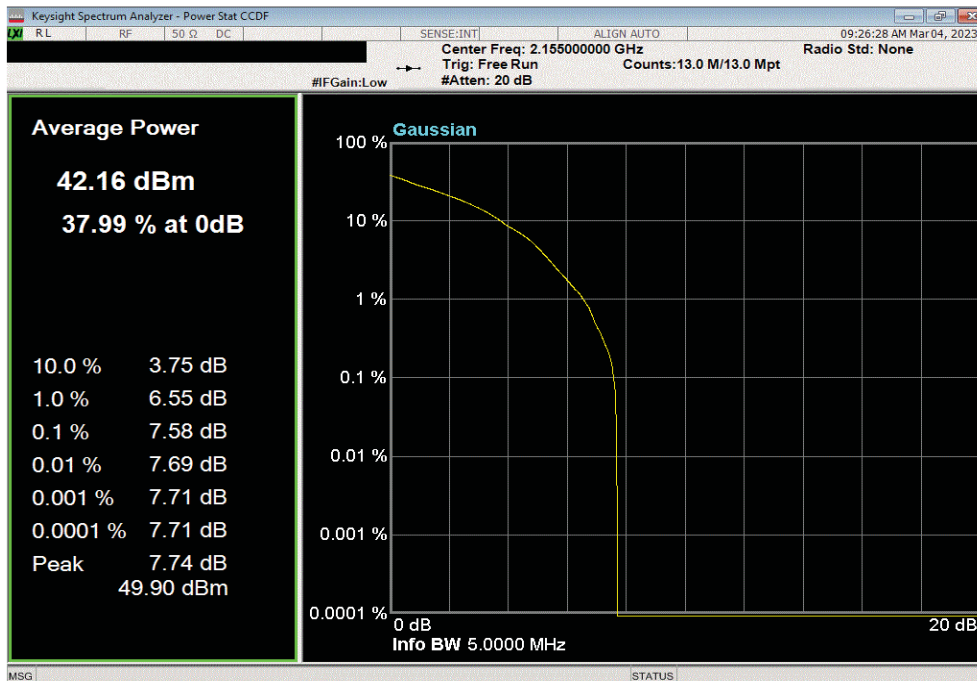


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 2110.2 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.58	13	N/A		



Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Mid Channel 2155 MHz						
		0.1% PAPR		PAPR		Results
		Value (dB)	Limit (dB)			
		7.58	13	N/A		

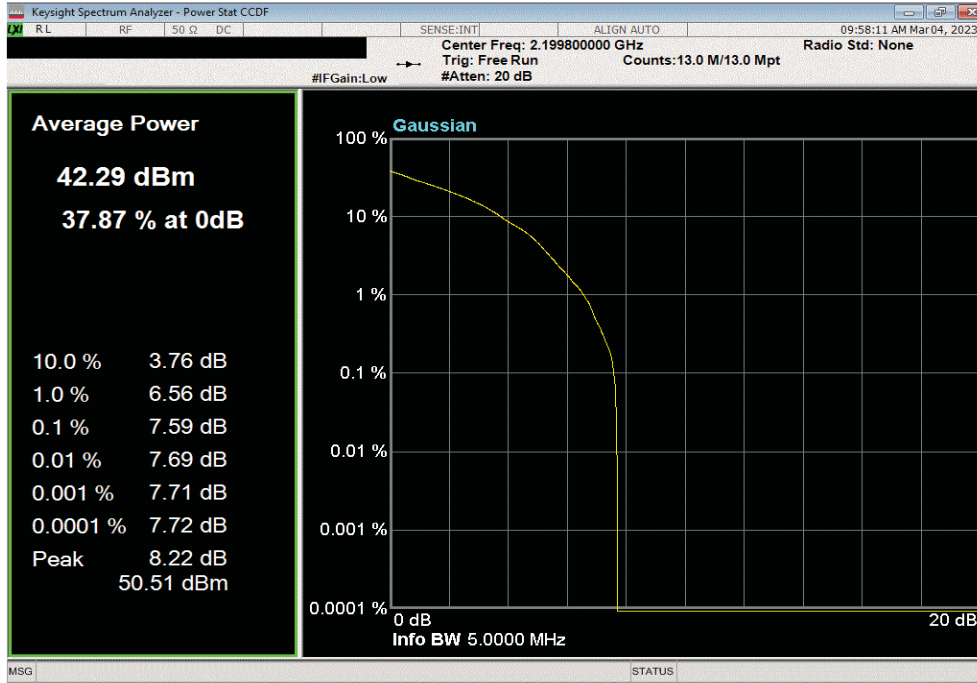


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND 66 NB- IoT-SB



TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 2199.8 MHz			
0.1% PAPR		PAPR	
Value (dB)	Limit (dB)	Results	
7.59	13	N/A	





XMI 2022.12.28.0

BAND EDGE COMPLIANCE - BAND n25 5G

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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 with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 24.238(a) and RSS 133 6.5.1 (i). the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 24.238(b) and RSS 133 6.5.1 (i). 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.

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

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 was small variation in band edge measurements over modulation types from previous certification testing for other channel bandwidths. The highest rate modulation type (256QAM) was used. (See ANSI C63.26. clause 5.7.2e).

BAND EDGE COMPLIANCE - BAND n25 5G



TbTx 2022.05.02.0 XMi 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFiI	Work Order:	NOKI0054
Serial Number:	BL2235N41PG	Date:	03/02/2023
Customer:	Nokia of America Corporation	Temperature:	23.3°C
Attendees:	John Rattanaovong, David Le	Humidity:	42.6%
Project:	None	Barometric Pres.:	977.4 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC
		Job Site:	TX07

TEST SPECIFICATIONS		Test Method	
FCC 24E:2020		ANSI C63.26:2015	
RSS-133 Issue 6:2013+A1:2018		ANSI C63.26:2015	

COMMENTS
 All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n25 carriers are enabled as maximum power (80 watts/carrier).

DEVIATIONS FROM TEST STANDARD
 None

Configuration #	NOKI0054-2	Signature	
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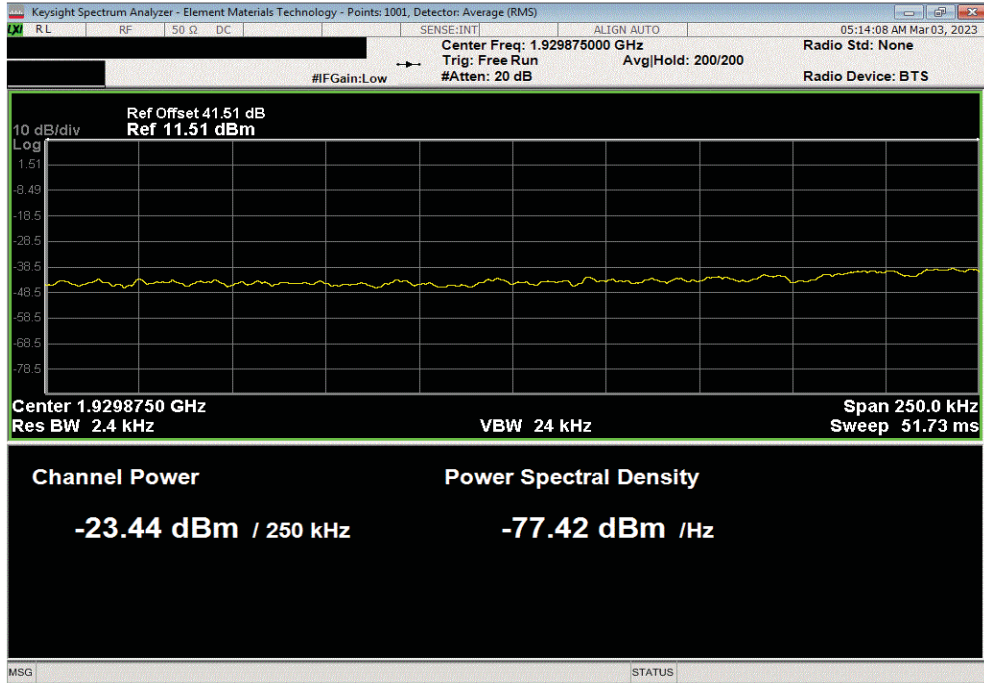
	Frequency Range	Max Value (dBm)	Limit < (dBm)	Result	
Band n25 1930 MHz - 1995 MHz, 5G NR					
Port 1					
25 MHz Bandwidth					
256-QAM Modulation					
	Low Channel 1942.5 MHz	1	-23.4	-19	Pass
	Low Channel 1942.5 MHz	2	-25.3	-19	Pass
	Low Channel 1942.5 MHz	3	-25.3	-19	Pass
	Low Channel 1942.5 MHz	4	-25.5	-19	Pass
	Low Channel 1942.5 MHz	5	-19.9	-19	Pass
	Low Channel 1942.5 MHz	6	-20.5	-19	Pass
	Low Channel 1942.5 MHz	7	-20.7	-19	Pass
	High Channel 1982.5 MHz	1	-23.5	-19	Pass
	High Channel 1982.5 MHz	2	-25.4	-19	Pass
	High Channel 1982.5 MHz	3	-25.6	-19	Pass
	High Channel 1982.5 MHz	4	-25.4	-19	Pass
	High Channel 1982.5 MHz	5	-19.4	-19	Pass
	High Channel 1982.5 MHz	6	-20.0	-19	Pass
	High Channel 1982.5 MHz	7	-20.3	-19	Pass

BAND EDGE COMPLIANCE - BAND n25 5G

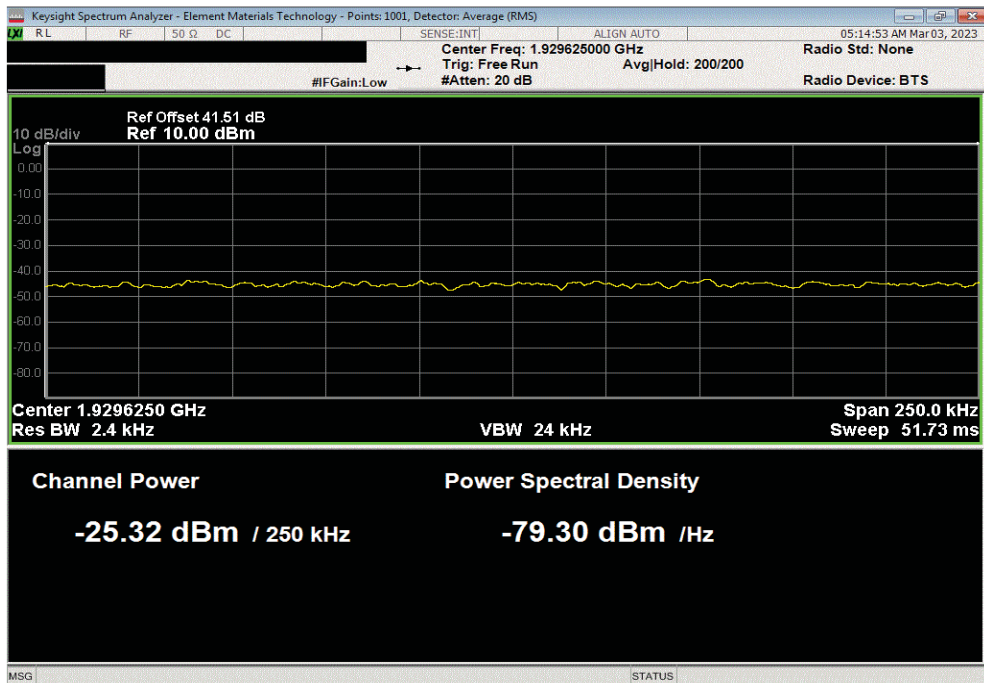


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
1	-23.44	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
2	-25.32	-19	Pass			

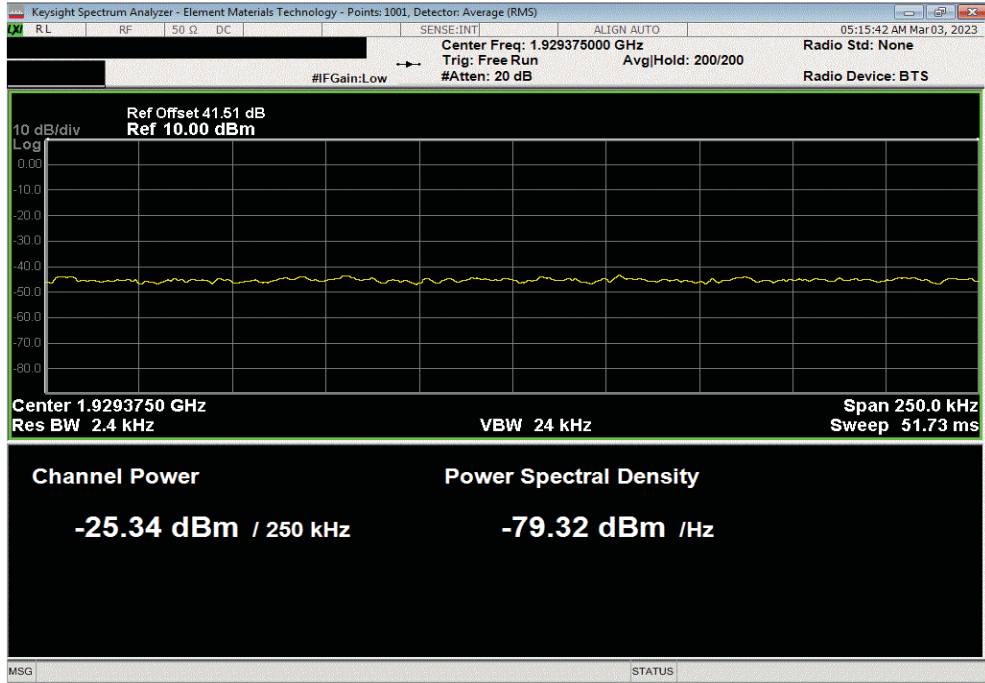


BAND EDGE COMPLIANCE - BAND n25 5G

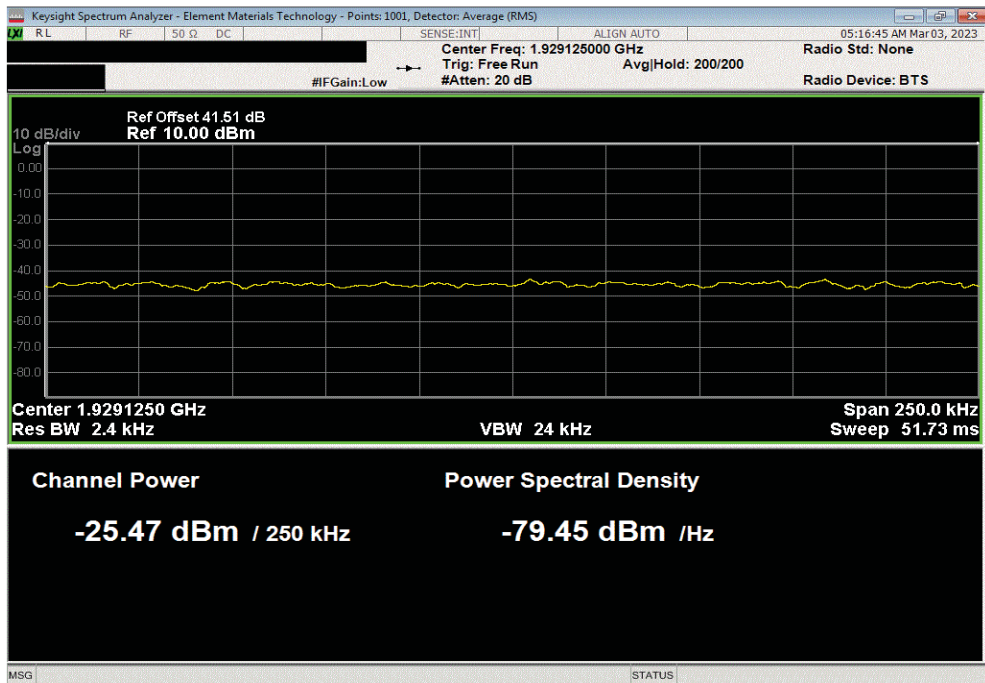


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
3	-25.34	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
4	-25.47	-19	Pass			

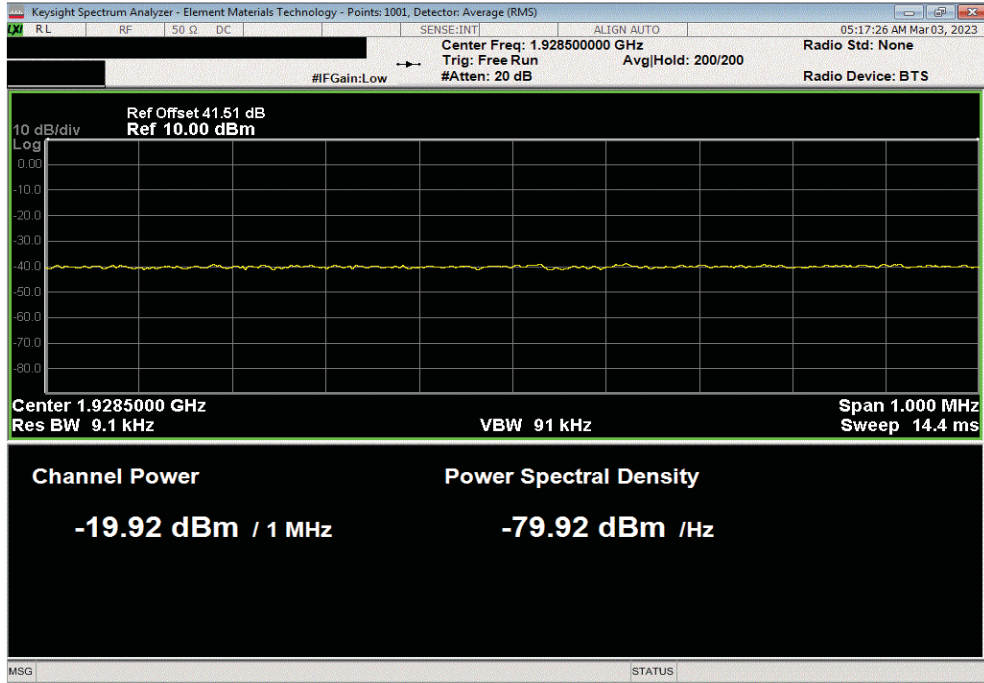


BAND EDGE COMPLIANCE - BAND n25 5G

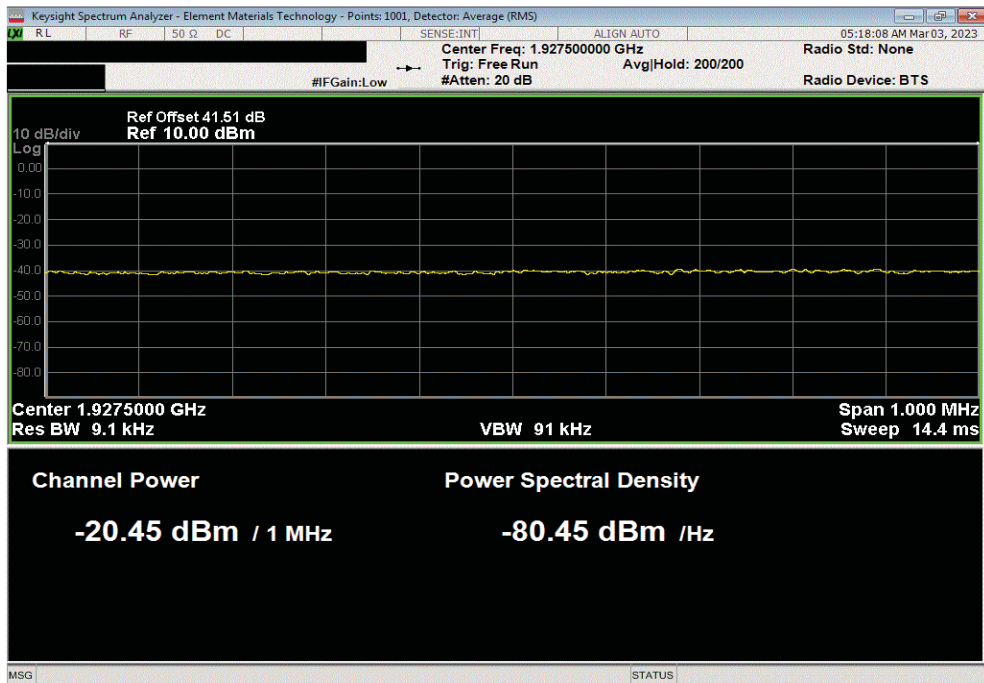


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
5	-19.92	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
6	-20.45	-19	Pass			

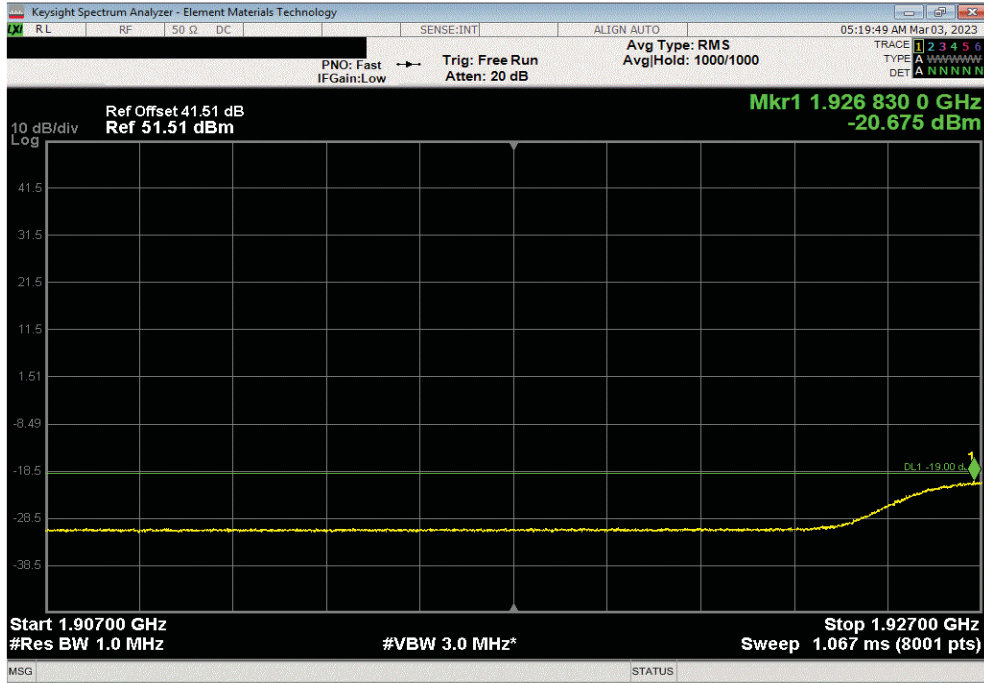


BAND EDGE COMPLIANCE - BAND n25 5G

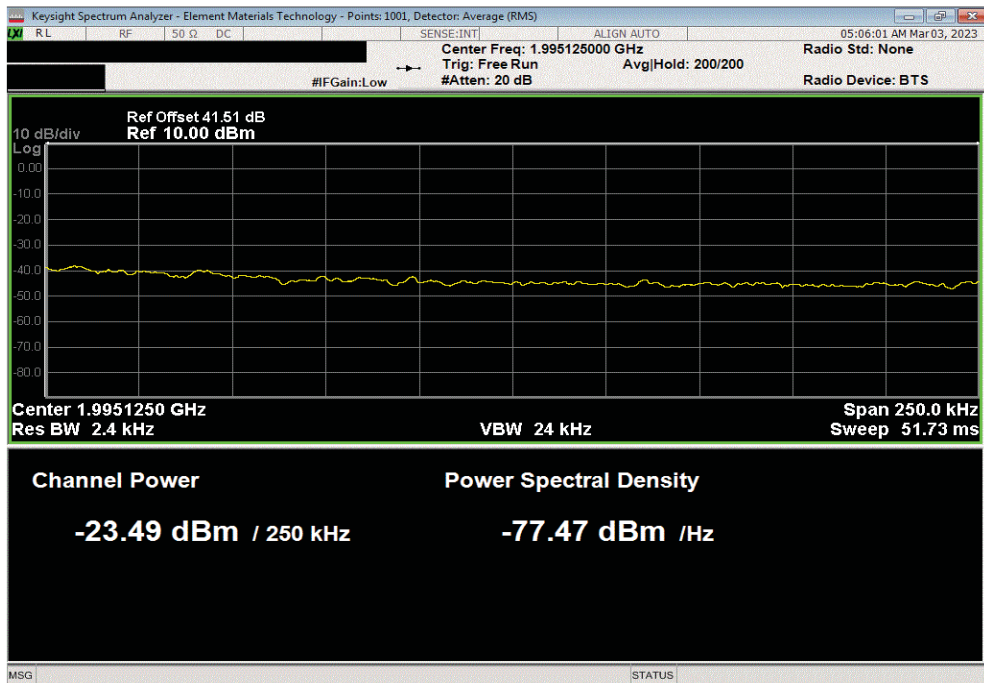


Test 2022.05.02.0 XMIT 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 1942.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
7	-20.68	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
1	-23.49	-19	Pass			

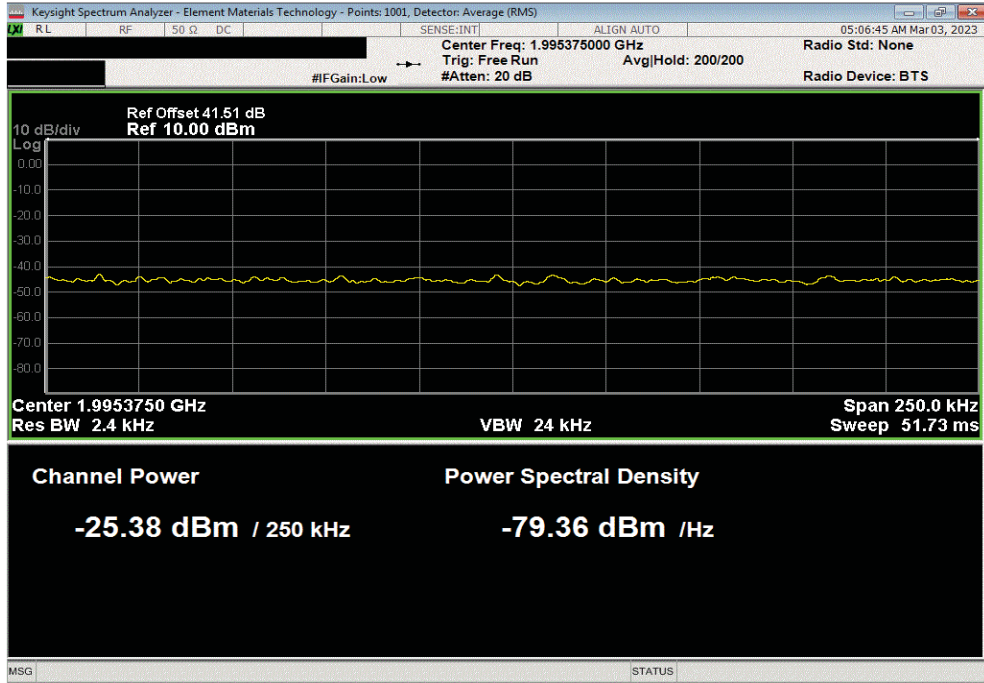


BAND EDGE COMPLIANCE - BAND n25 5G

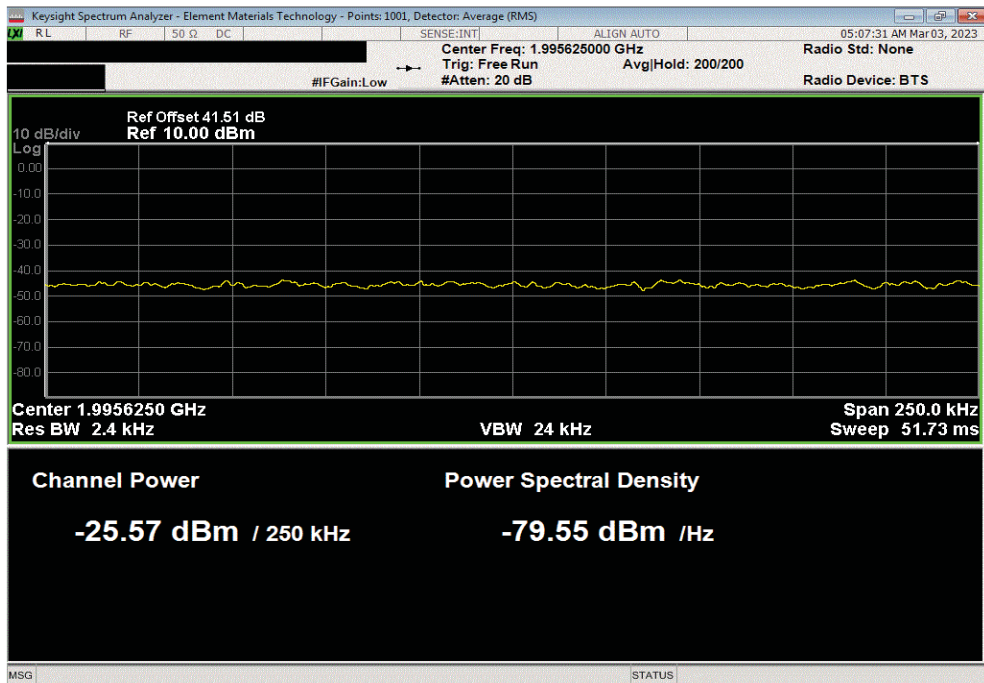


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
2	-25.38	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
3	-25.57	-19	Pass			

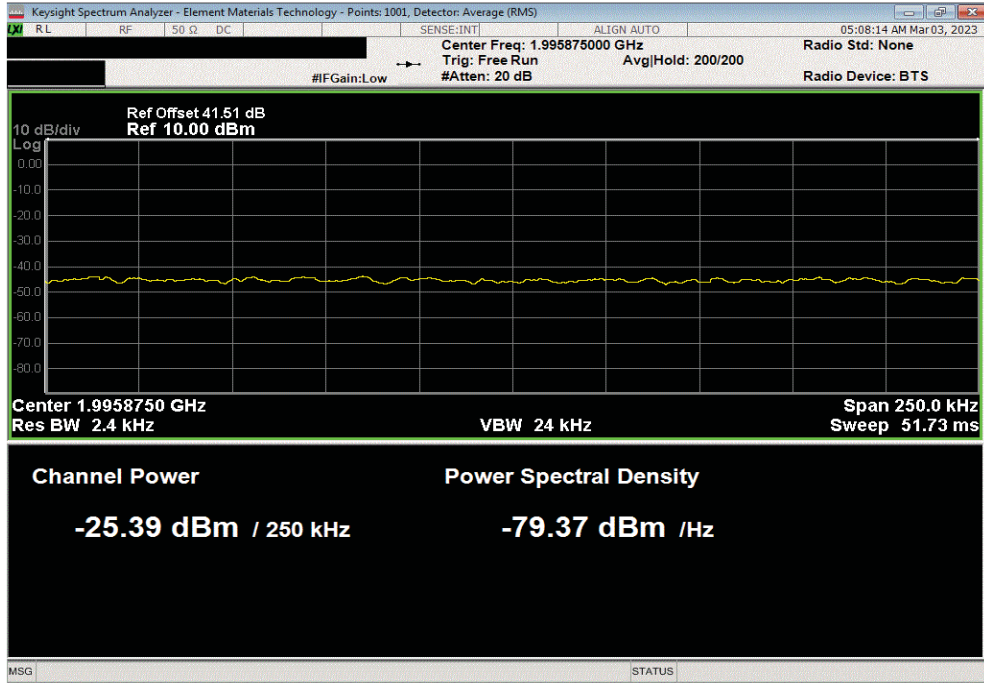


BAND EDGE COMPLIANCE - BAND n25 5G

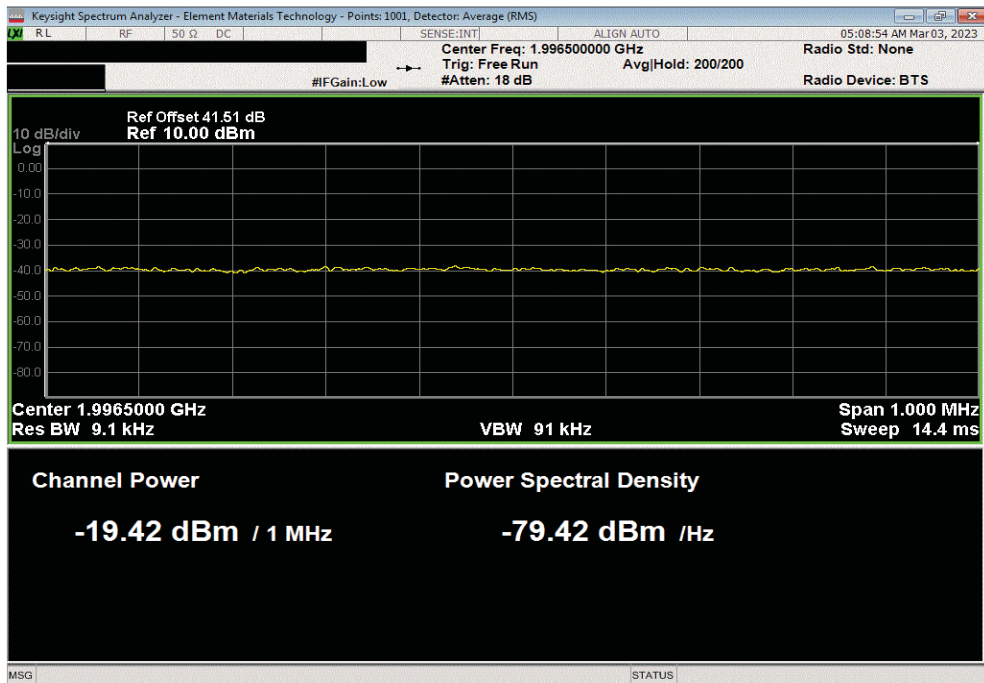


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
4	-25.39	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
5	-19.42	-19	Pass			

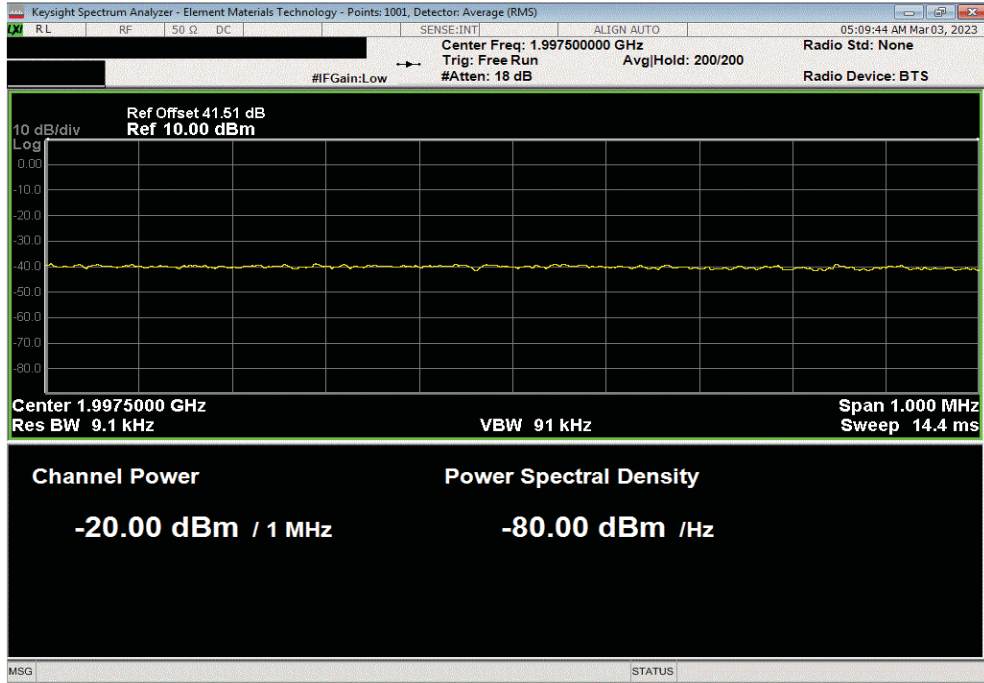


BAND EDGE COMPLIANCE - BAND n25 5G

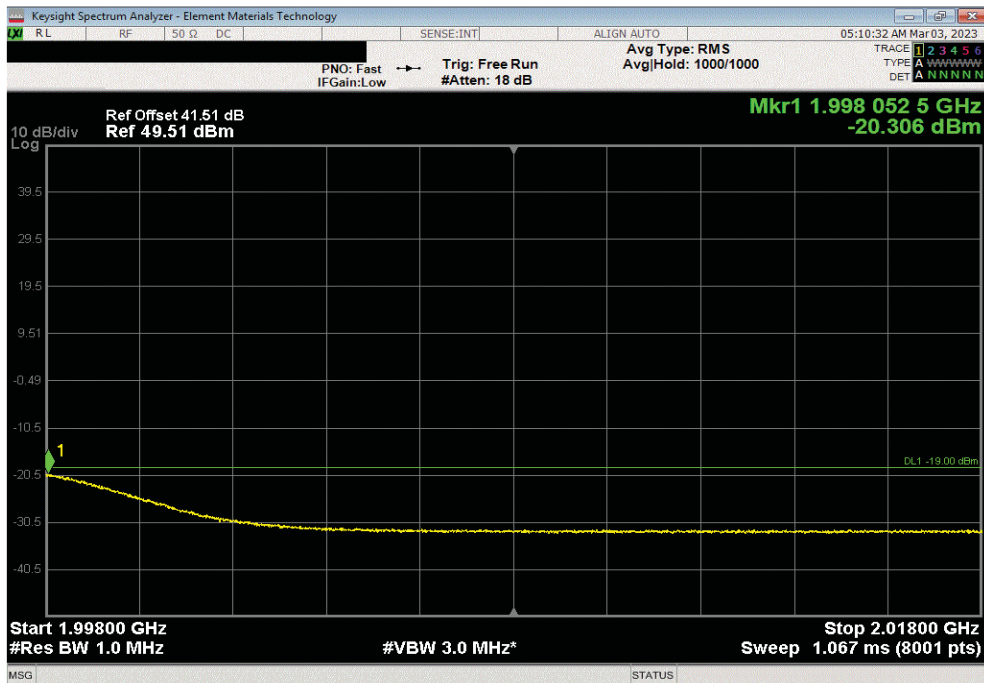


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
6	-20.00	-19	Pass			



Band n25 1930 MHz - 1995 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 1982.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
7	-20.31	-19	Pass			





XMI 2022.12.28.0

BAND EDGE COMPLIANCE - BAND 25 LTE

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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 with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 24.238(a) and RSS 133 6.5.1 (i). the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 24.238(b) and RSS 133 6.5.1 (i). 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.

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

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, there is significant/good passing margin, and previous compliance testing was successfully performed using a high average power level. The highest rate modulation type (256QAM) was used. (See ANSI C63.26. clause 5.7.2e).

BAND EDGE COMPLIANCE - BAND 25 LTE



TRx 2022.05.02.0 XMR 2022.12.28.0

EUT: Aircscale Base Transceiver Station Remote Radio Head Model AHFI		Work Order: NOKI0054
Serial Number: BL2235N41PG	Date: 03/03/2023	
Customer: Nokia of America Corporation	Temperature: 23.8°C	
Attendees: John Rattanavong, David Le	Humidity: 39.5%	
Project: None	Barometric Pres.: 983.2 mbar	
Tested by: Brandon Hobbs and Jarrod Brenden	Power: 54 VDC	Job Site: TX07

TEST SPECIFICATIONS	Test Method
FCC 24E:2022	ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018	ANSI C63.26:2015

COMMENTS
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carriers are enabled at 20 watts/carrier.

DEVIATIONS FROM TEST STANDARD
None

Configuration #	NOKI0054-2	Signature 
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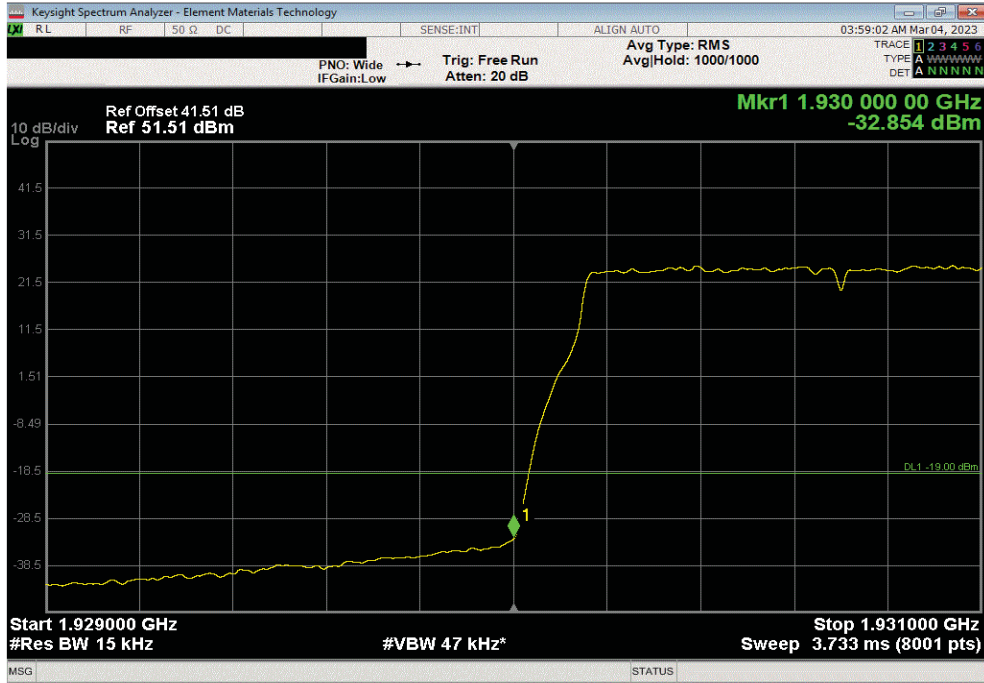
	Frequency Range	Max Value (dBm)	Limit (dBm)	Result	
Band 25 1930 MHz - 1995 MHz, LTE					
Port 1					
1.4 MHz Bandwidth					
256-QAM Modulation					
	Low Channel 1930.7 MHz	1	-32.9	-19	Pass
	Low Channel 1930.7 MHz	2	-26.4	-19	Pass
	Low Channel 1930.7 MHz	3	-26.5	-19	Pass
	High Channel 1989.3 MH	1	-31.6	-19	Pass
	High Channel 1989.3 MH	2	-24.9	-19	Pass
	High Channel 1989.3 MH	3	-25.9	-19	Pass

BAND EDGE COMPLIANCE - BAND 25 LTE

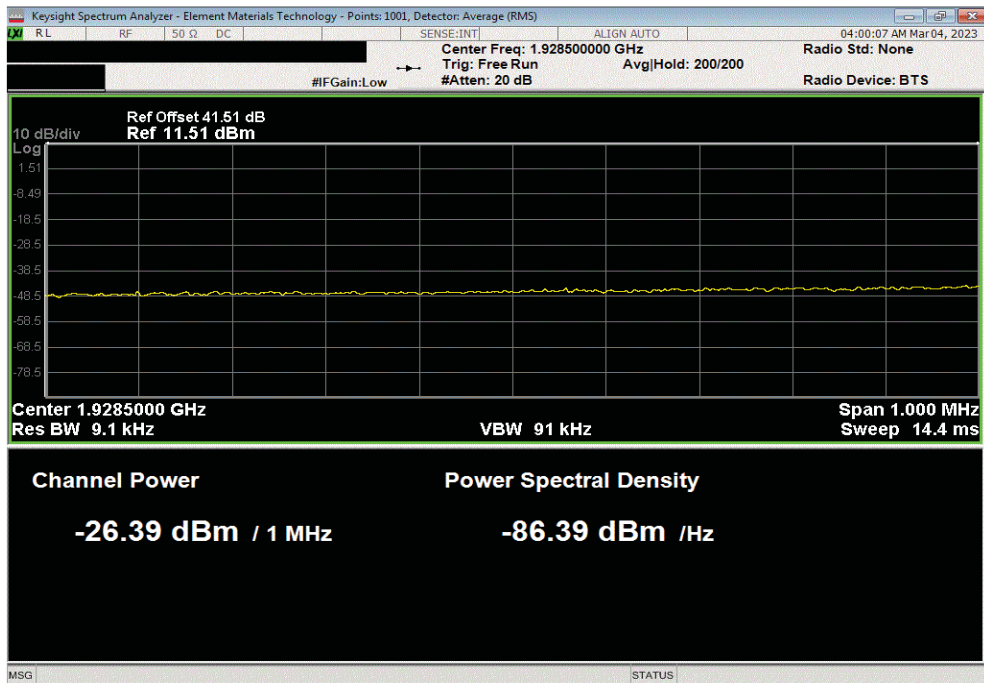


TestX 2022.05.02.0 XMIT 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
1	-32.85	-19	Pass			



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-26.39	-19	Pass			

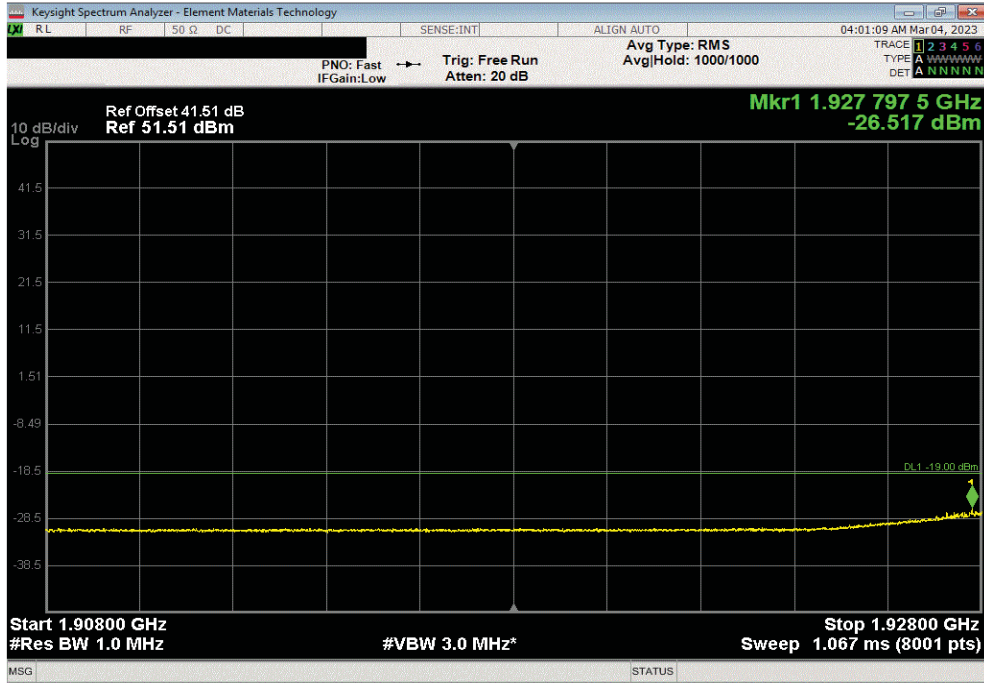


BAND EDGE COMPLIANCE - BAND 25 LTE

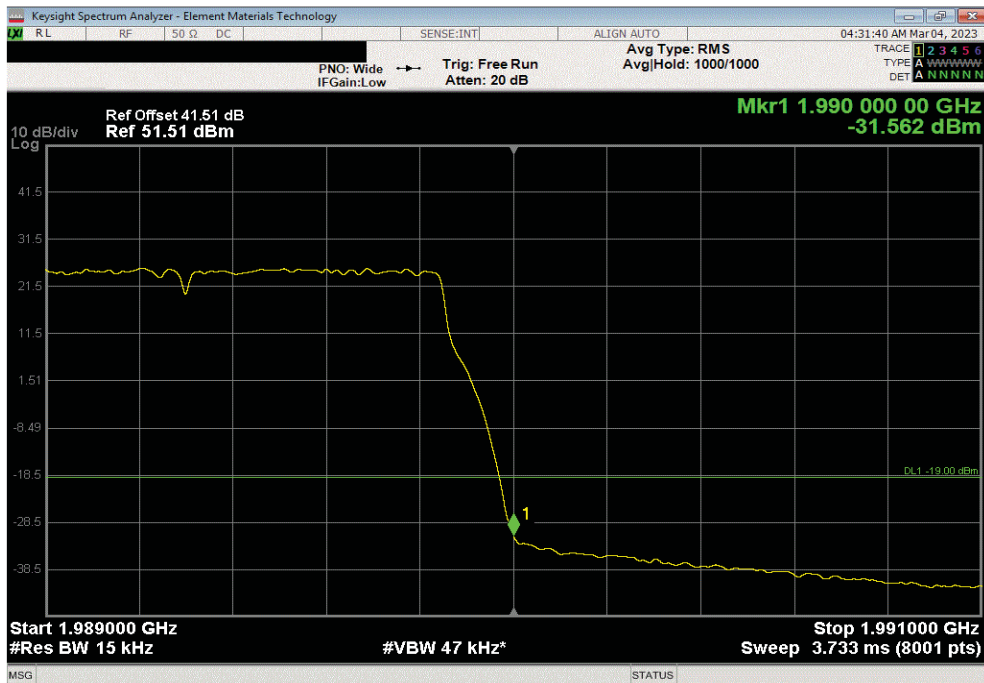


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 1930.7 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
3	-26.52	-19	Pass			



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
1	-31.56	-19	Pass			

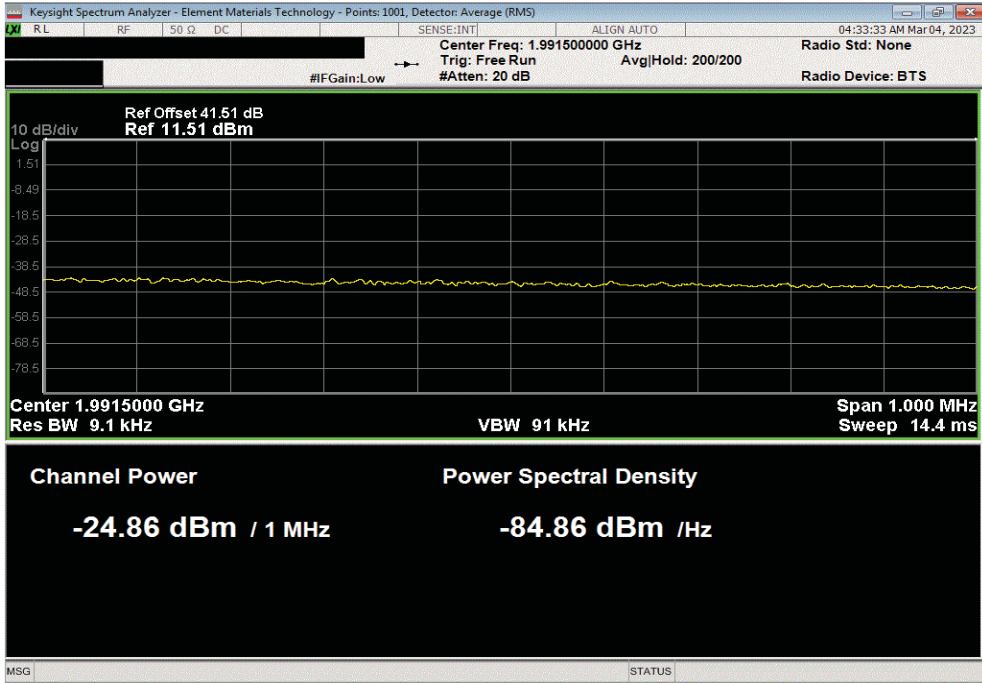


BAND EDGE COMPLIANCE - BAND 25 LTE

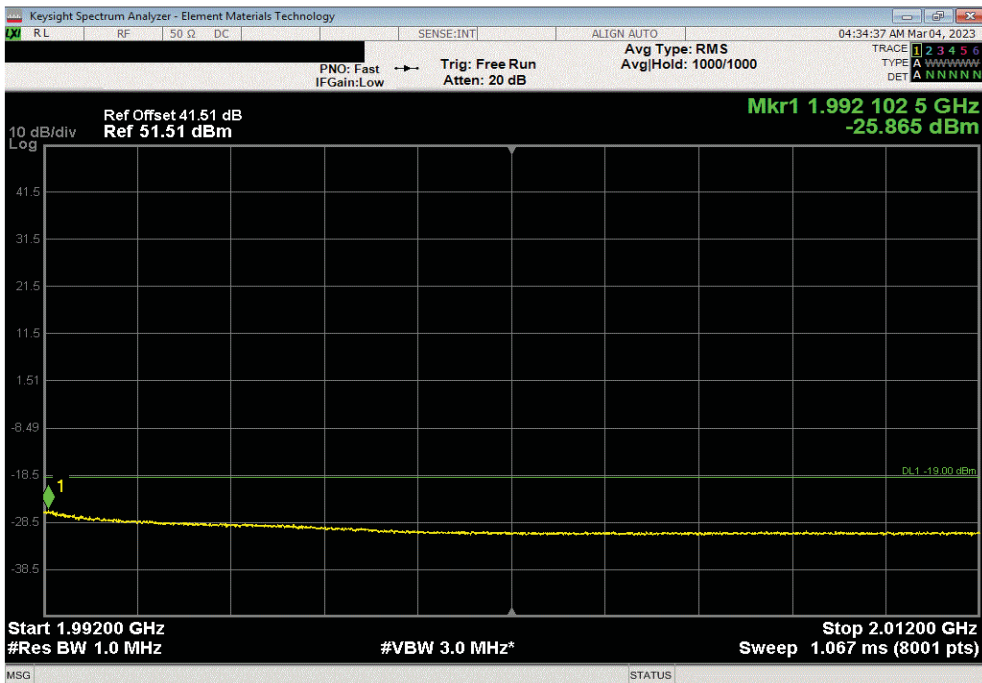


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-24.86	-19	Pass			



Band 25 1930 MHz - 1995 MHz, LTE, Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 1989.3 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
3	-25.87	-19	Pass			



BAND EDGE COMPLIANCE - BAND 25 NB-IoT-SA



XMI 2022.12.28.0

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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 with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 24.238(a) and RSS 133 6.5.1 (i). the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 24.238(b) and RSS 133 6.5.1 (i). 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.

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

BAND EDGE COMPLIANCE - BAND 25 NB-IoT-SA



TstTx 2022.05.02.0 XMI 2022.12.28.0

EUT: Airscale Base Transceiver Station Remote Radio Head Model AHFII		Work Order: NOKI0054
Serial Number: BL2235N41PG		Date: 03/03/2023
Customer: Nokia of America Corporation		Temperature: 26.9°C
Attendees: John Rattanavong, David Le		Humidity: 30.1%
Project: None		Barometric Pres.: 983.8 mbar
Tested by: Brandon Hobbs and Jarrod Brenden		Power: 54 VDC
		Job Site: TX07

TEST SPECIFICATIONS		Test Method
FCC 24E:2022		ANSI C63.26:2015
RSS-133 Issue 6:2013+A1:2018		ANSI C63.26:2015

COMMENTS
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The NB IoT SA carriers are enabled at maximum power (20 watts/carrier).

DEVIATIONS FROM TEST STANDARD

None

Configuration #	NOKI0054-2	Signature 
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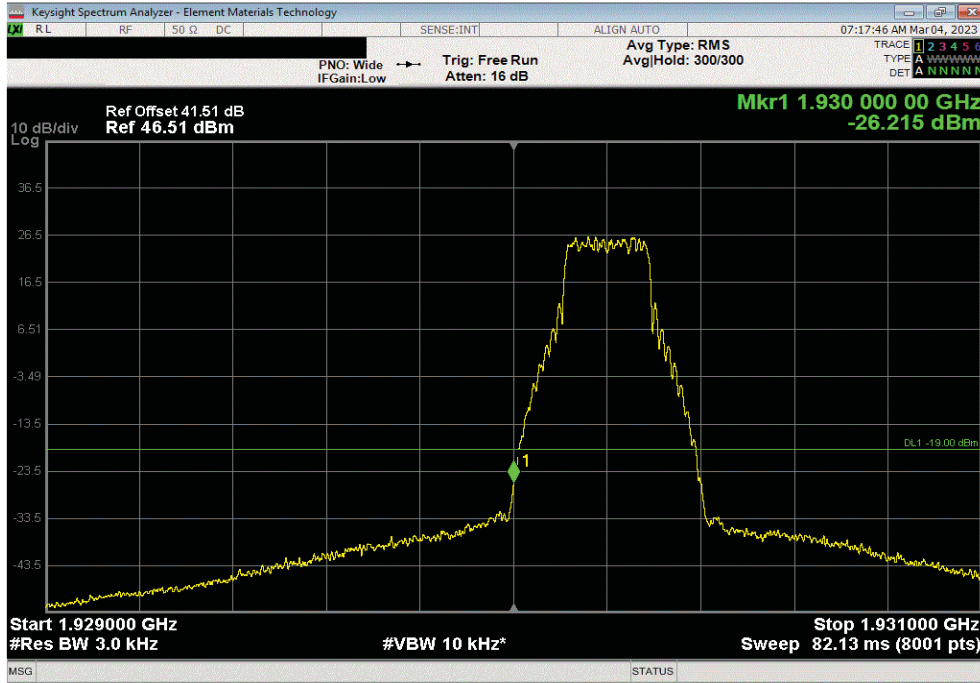
	Frequency Range	Max Value (dBm)	Limit (dBm)	Result	
Band 25 1930 MHz - 1995 MHz, NB-IoT					
Port 1					
200 KHz Bandwidth					
NTM Modulation					
	Low Channel 1930.2 MHz	1	-26.2	-19	Pass
	Low Channel 1930.2 MHz	2	-27.5	-19	Pass
	Low Channel 1930.2 MHz	3	-27.5	-19	Pass
	High Channel 1994.8 MH	1	-26.8	-19	Pass
	High Channel 1994.8 MH	2	-22.2	-19	Pass
	High Channel 1994.8 MH	3	-22.2	-19	Pass

BAND EDGE COMPLIANCE - BAND 25 NB-IoT-SA

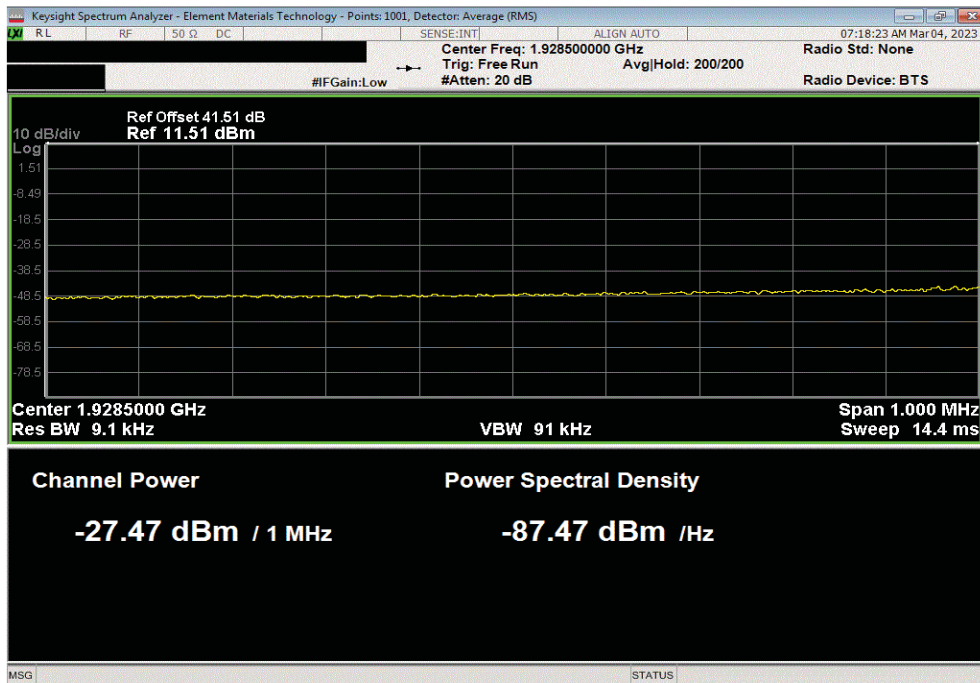


TestX 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
1	-26.22	-19	Pass			



Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-27.47	-19	Pass			

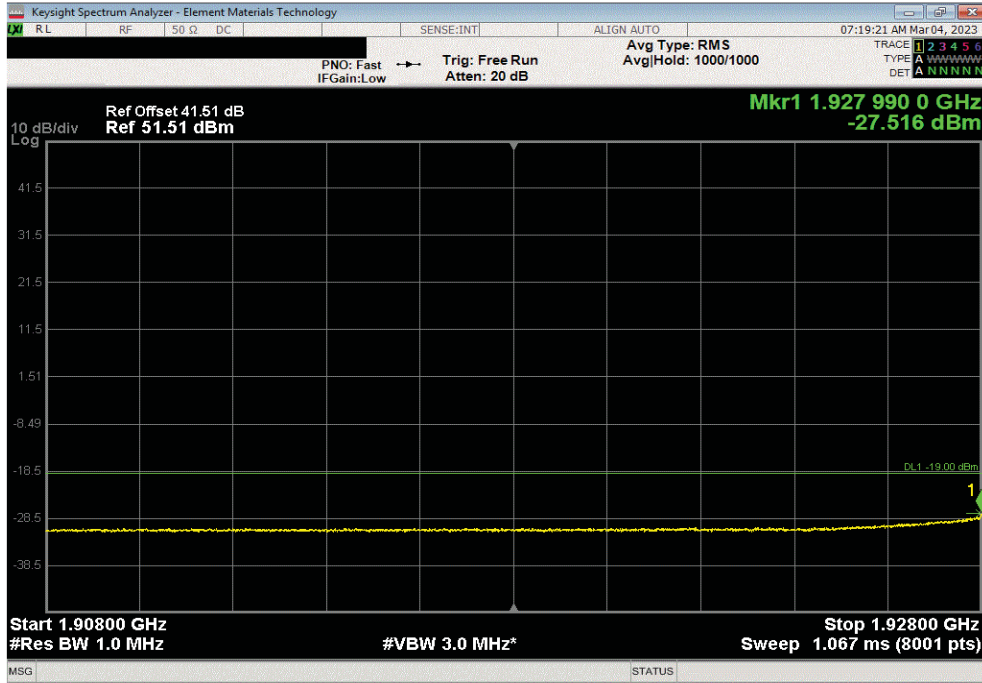


BAND EDGE COMPLIANCE - BAND 25 NB-IoT-SA

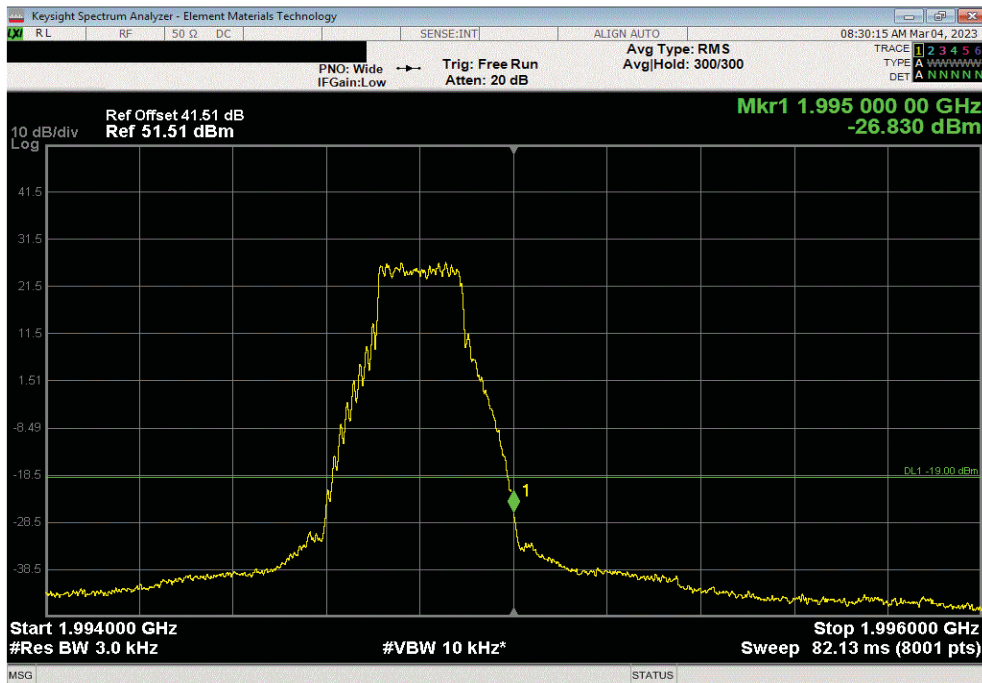


Test 2022.05.02.0 XMIT 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, Low Channel 1930.2 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
3	-27.52	-19	Pass			



Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
1	-26.83	-19	Pass			

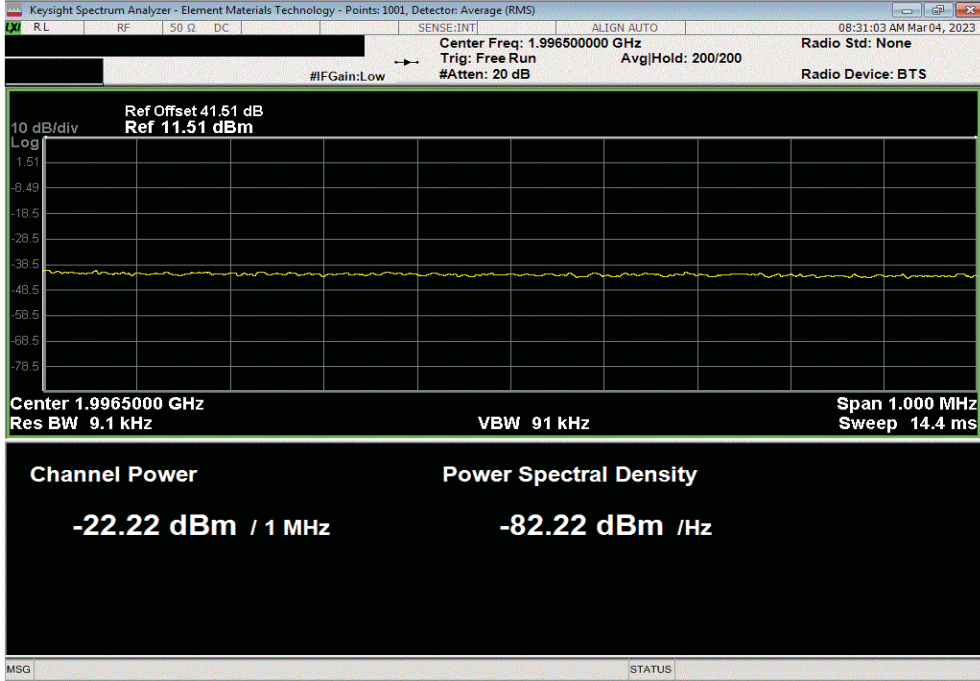


BAND EDGE COMPLIANCE - BAND 25 NB-IoT-SA

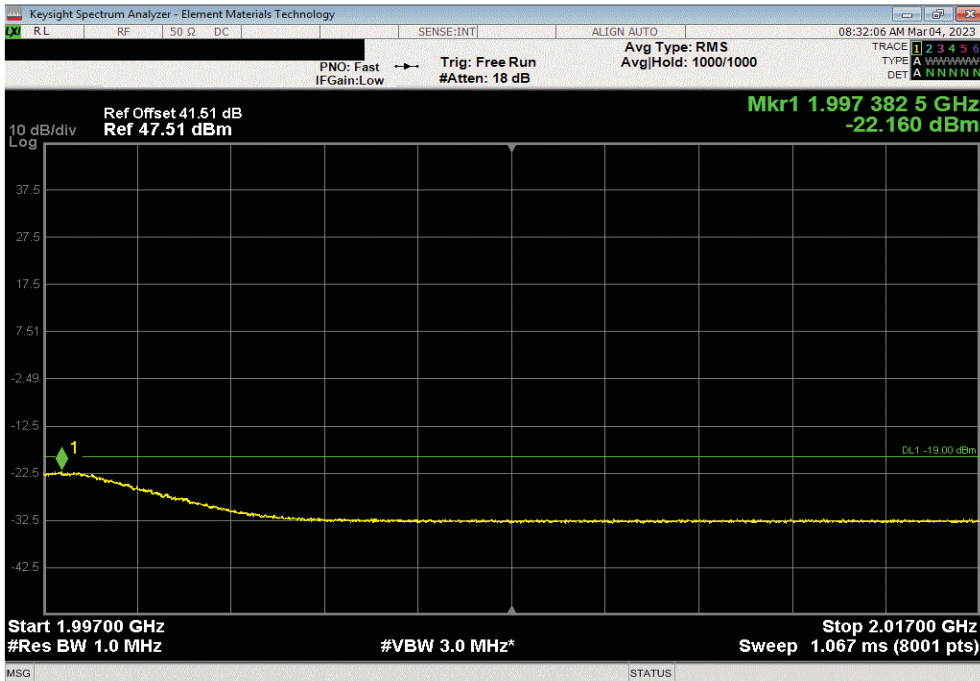


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-22.22	-19	Pass			



Band 25 1930 MHz - 1995 MHz, NB-IoT, Port 1, 200 KHz Bandwidth, NTM Modulation, High Channel 1994.8 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
3	-22.16	-19	Pass			





XMI 2022.12.28.0

BAND EDGE COMPLIANCE - Band n66 5G

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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 with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per FCC 27.53(h) and RSS-139 6.6 the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per FCC 27.53(h) and RSS-139 6.6 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.


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

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 was small variation in band edge measurements over modulation types from previous certification testing for other channel bandwidths. The highest rate modulation type (256QAM) was used. (See ANSI C63.26. clause 5.7.2e).

BAND EDGE COMPLIANCE - Band n66 5G



TbTx 2022.05.02.0 XMit 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFII	Work Order:	NOKI0054
Serial Number:	BL2235N41PG	Date:	03/02/2023
Customer:	Nokia of America Corporation	Temperature:	23.4°C
Attendees:	John Rattanavong, David Le	Humidity:	42.5%
Project:	None	Barometric Pres.:	997.4 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC
TEST SPECIFICATIONS		Job Site: TX07	
FCC 27:2023		Test Method	
RSS-139 Issue 4:2022		ANSI C63.26:2015	
COMMENTS		ANSI C63.26:2015	
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. Band n66 carriers are enabled as maximum power (80 watts/carrier).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	NOKI0054-2	Signature 	

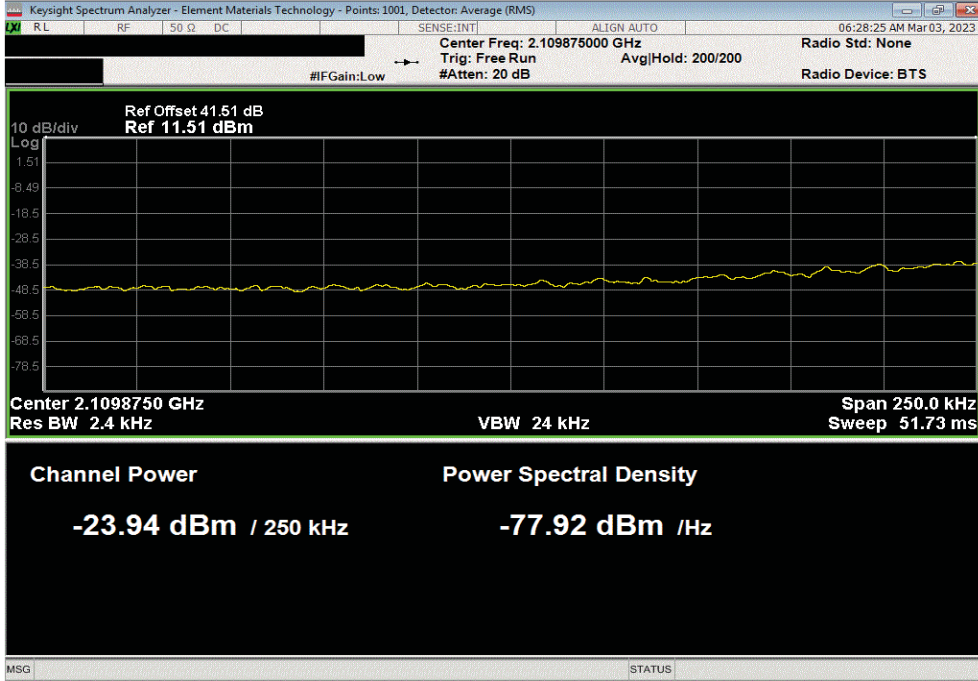
Band n66 2110 MHz - 2200 MHz, 5G NR	Frequency Range	Max Value (dBm)	Limit < (dBm)	Result
Port 1				
25 MHz Bandwidth				
256-QAM Modulation				
Low Channel 2122.5 MHz	1	-23.9	-19	Pass
Low Channel 2122.5 MHz	2	-28.3	-19	Pass
Low Channel 2122.5 MHz	3	-28.2	-19	Pass
Low Channel 2122.5 MHz	4	-28.6	-19	Pass
Low Channel 2122.5 MHz	5	-22.9	-19	Pass
Low Channel 2122.5 MHz	6	-23.3	-19	Pass
Low Channel 2122.5 MHz	7	-23.1	-19	Pass
High Channel 2187.5 MHz	1	-23.8	-19	Pass
High Channel 2187.5 MHz	2	-27.6	-19	Pass
High Channel 2187.5 MHz	3	-27.8	-19	Pass
High Channel 2187.5 MHz	4	-27.8	-19	Pass
High Channel 2187.5 MHz	5	-22.2	-19	Pass
High Channel 2187.5 MHz	6	-22.4	-19	Pass
High Channel 2187.5 MHz	7	-22.1	-19	Pass

BAND EDGE COMPLIANCE - Band n66 5G

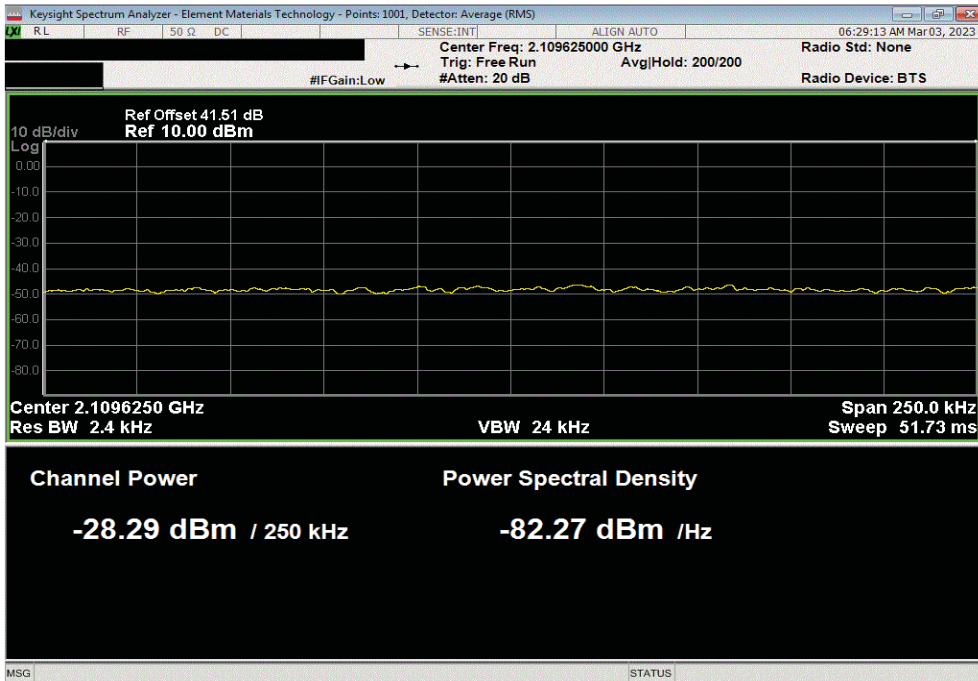


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
1	-23.94	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
2	-28.29	-19	Pass			

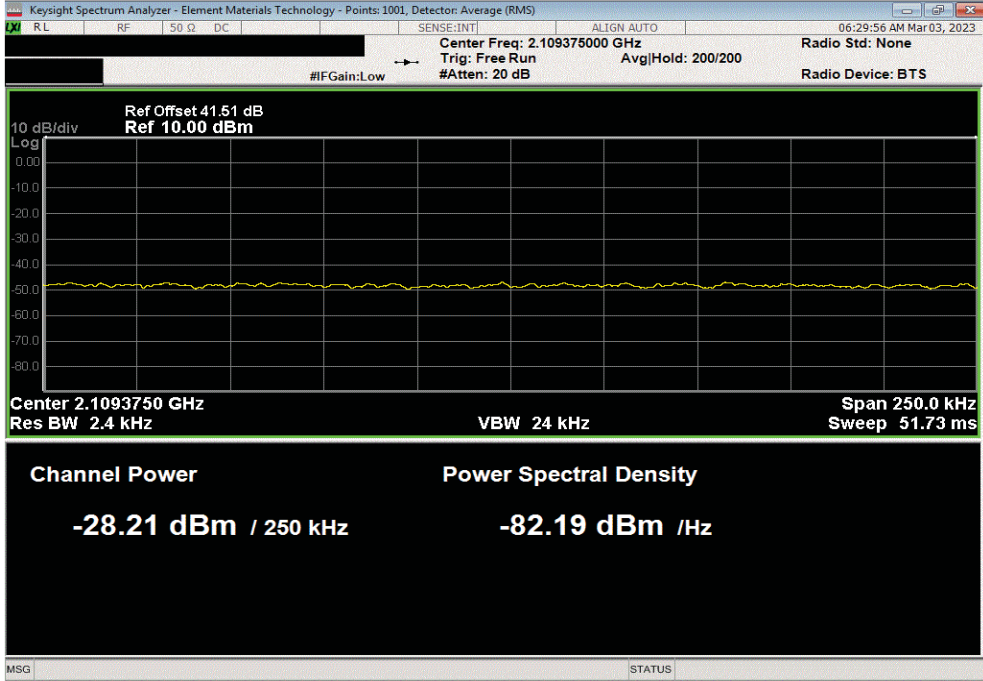


BAND EDGE COMPLIANCE - Band n66 5G

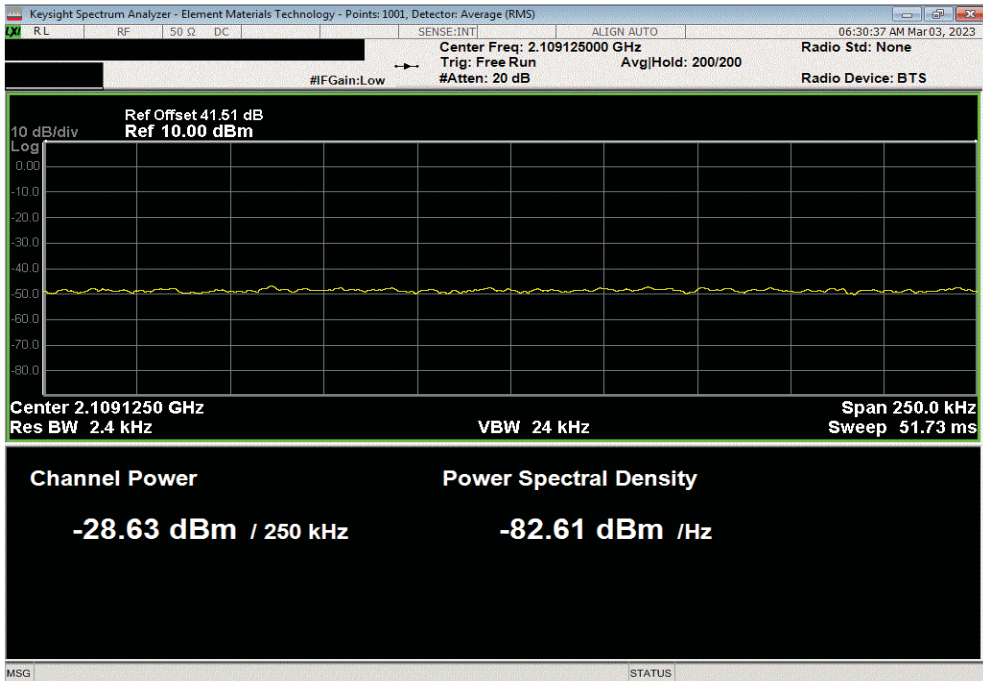


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
3	-28.21	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
4	-28.63	-19	Pass			

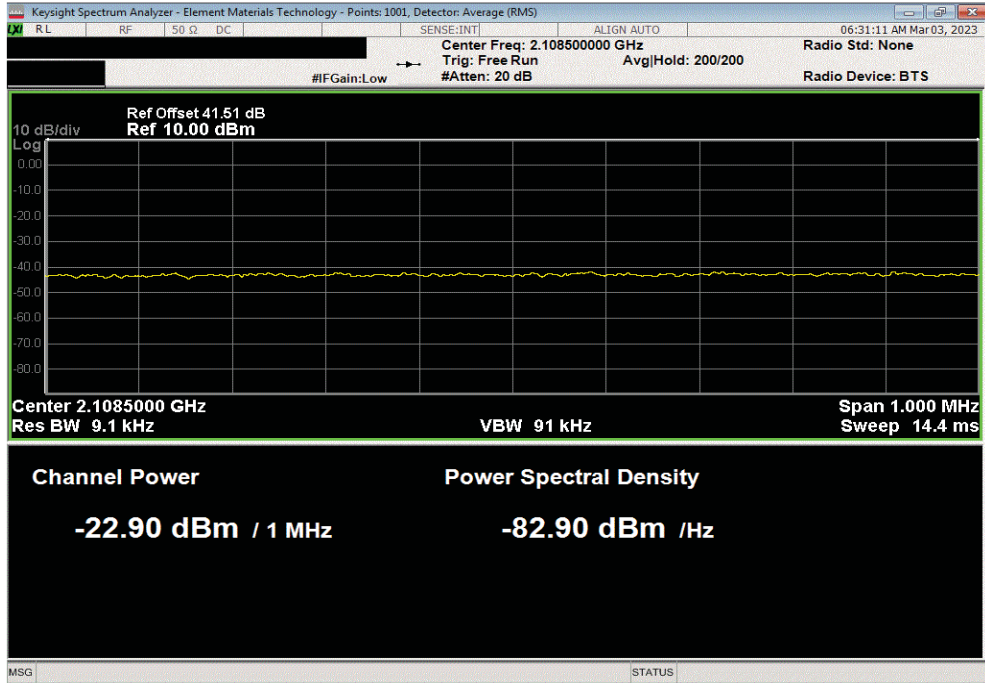


BAND EDGE COMPLIANCE - Band n66 5G

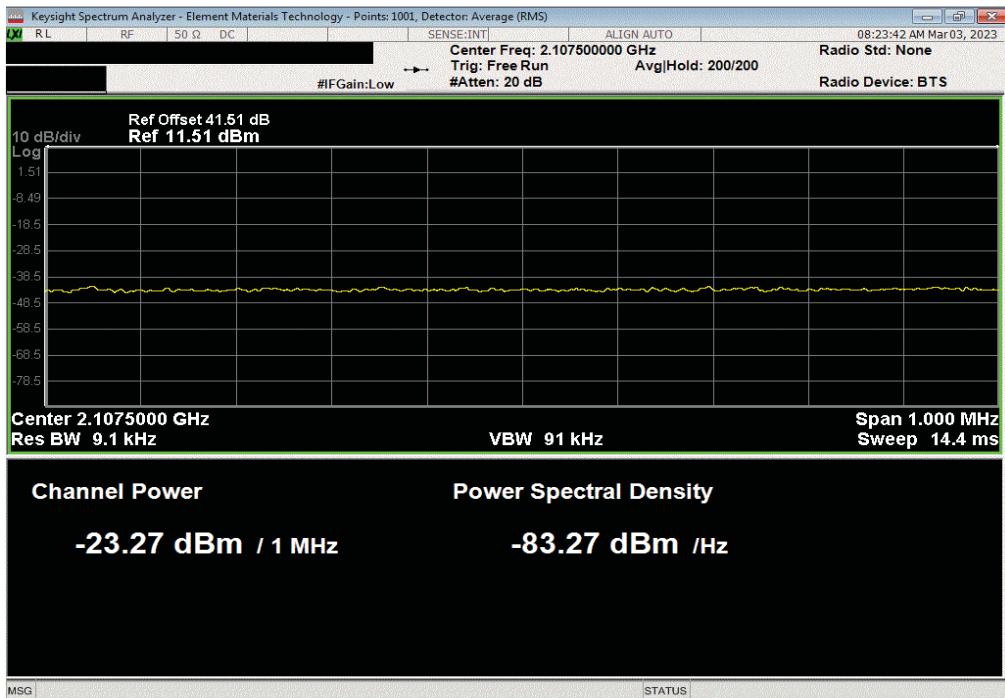


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
5	-22.90	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
6	-23.27	-19	Pass			

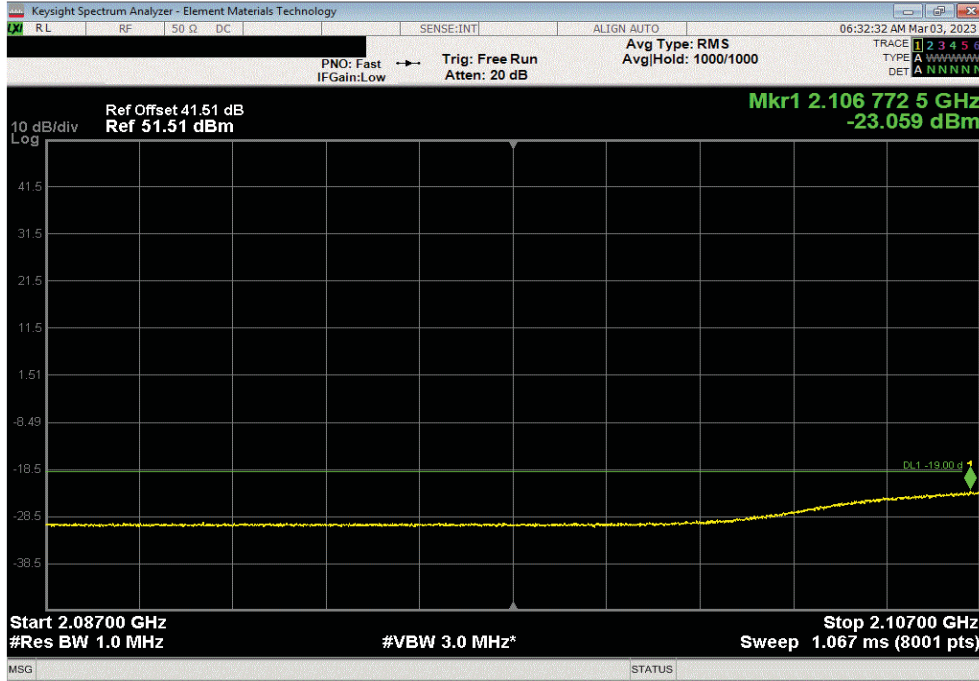


BAND EDGE COMPLIANCE - Band n66 5G

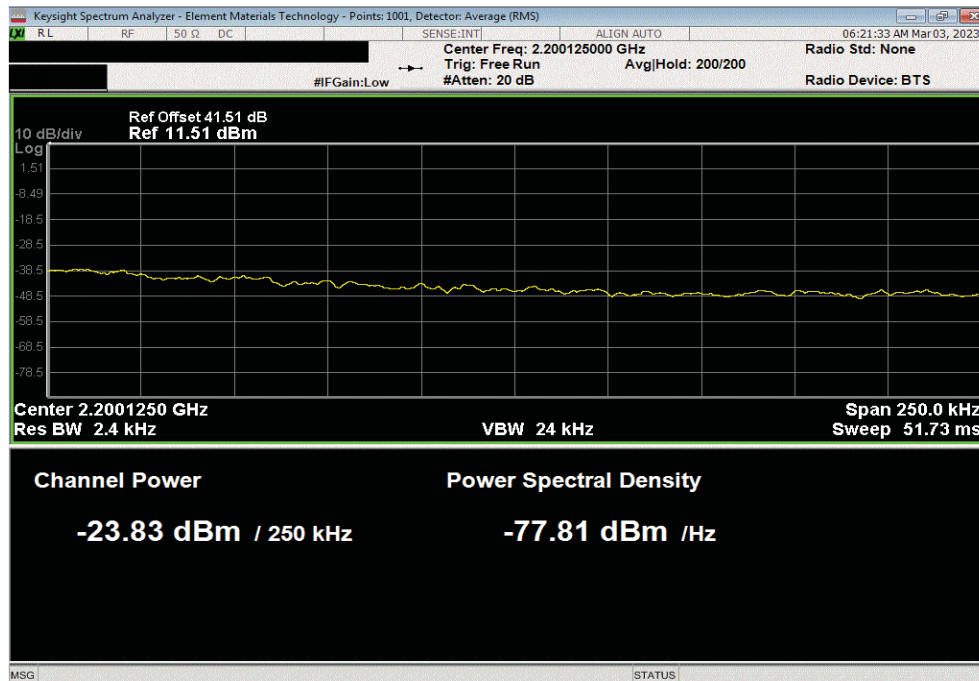


TestX 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, Low Channel 2122.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
7	-23.06	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
1	-23.83	-19	Pass			

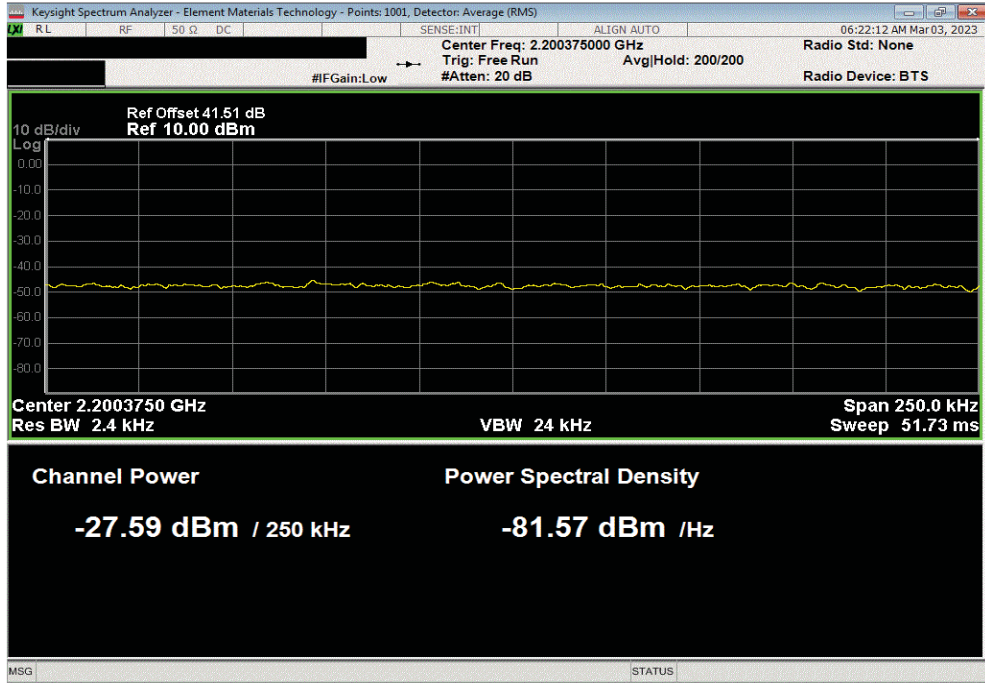


BAND EDGE COMPLIANCE - Band n66 5G

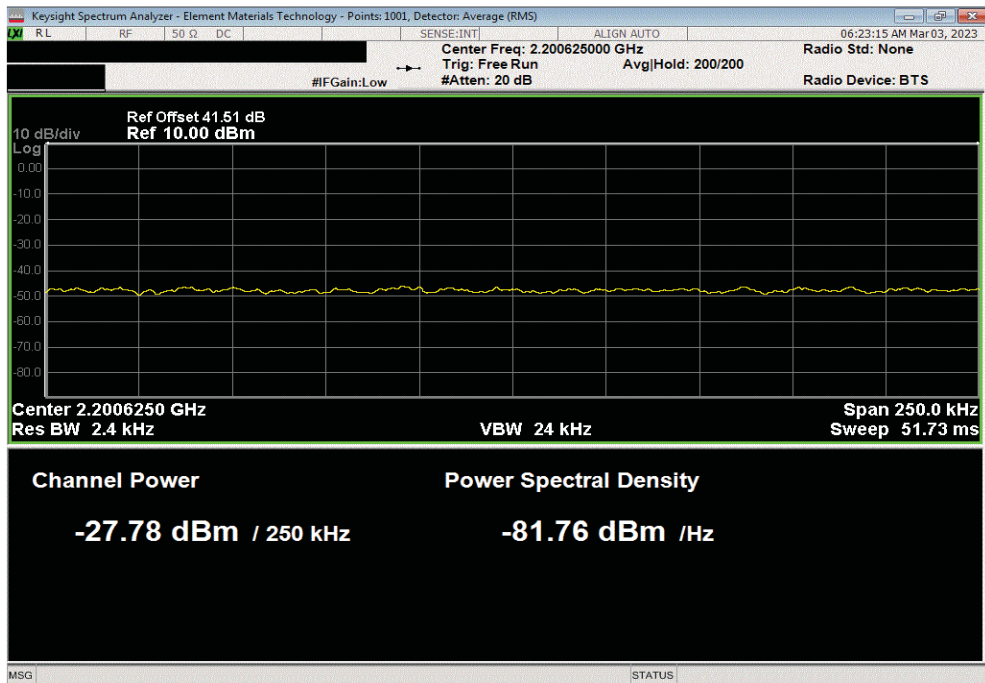


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
2	-27.59	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
3	-27.78	-19	Pass			

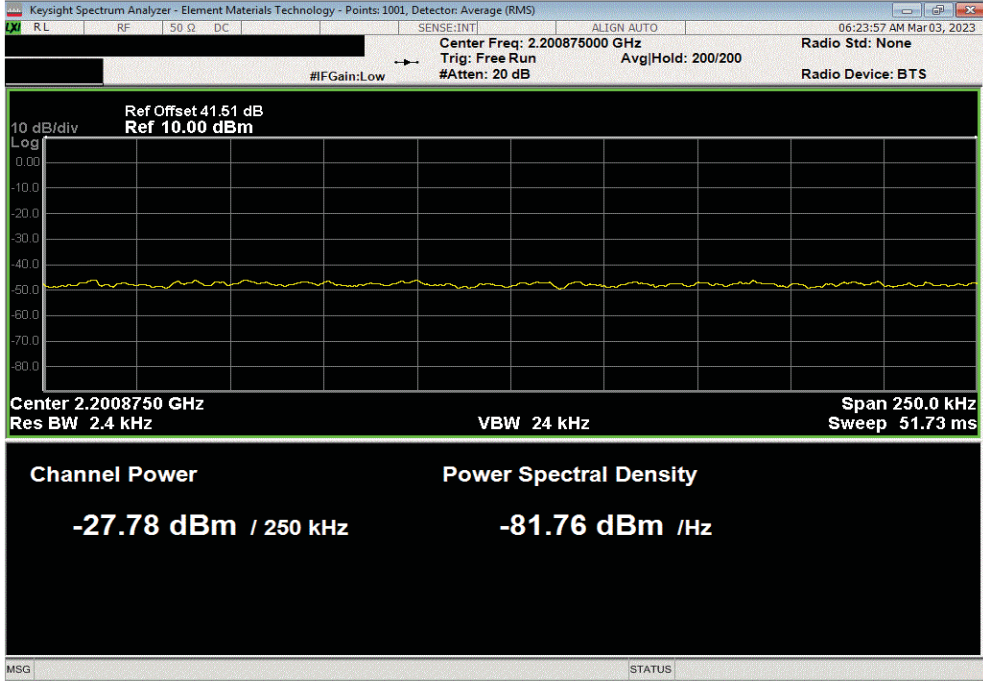


BAND EDGE COMPLIANCE - Band n66 5G

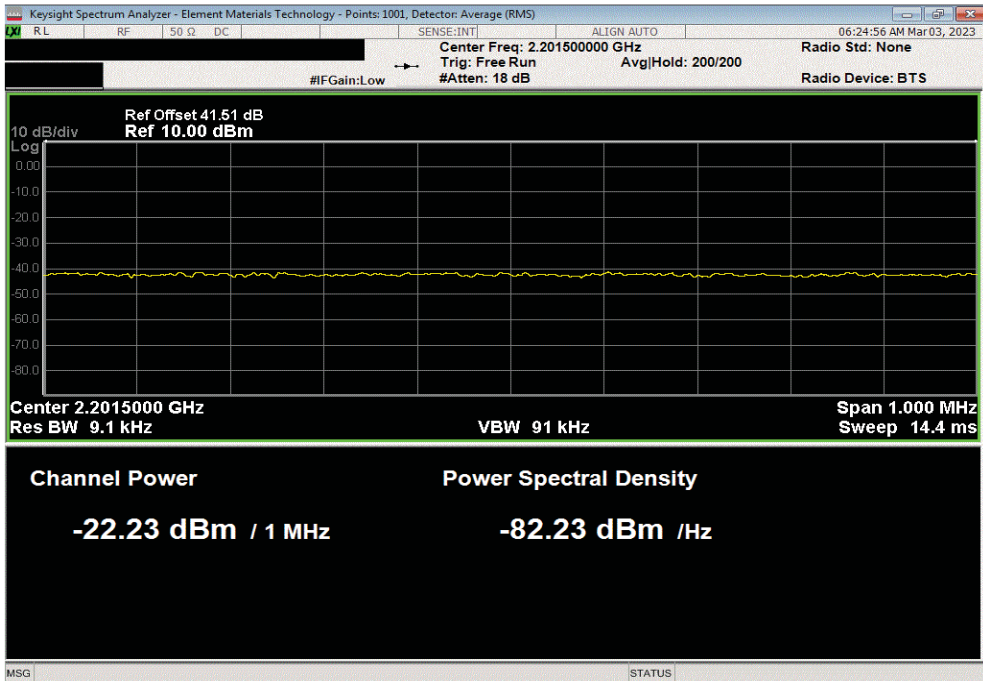


TxFx 2022.05.02.0 XMI 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
4	-27.78	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
5	-22.23	-19	Pass			

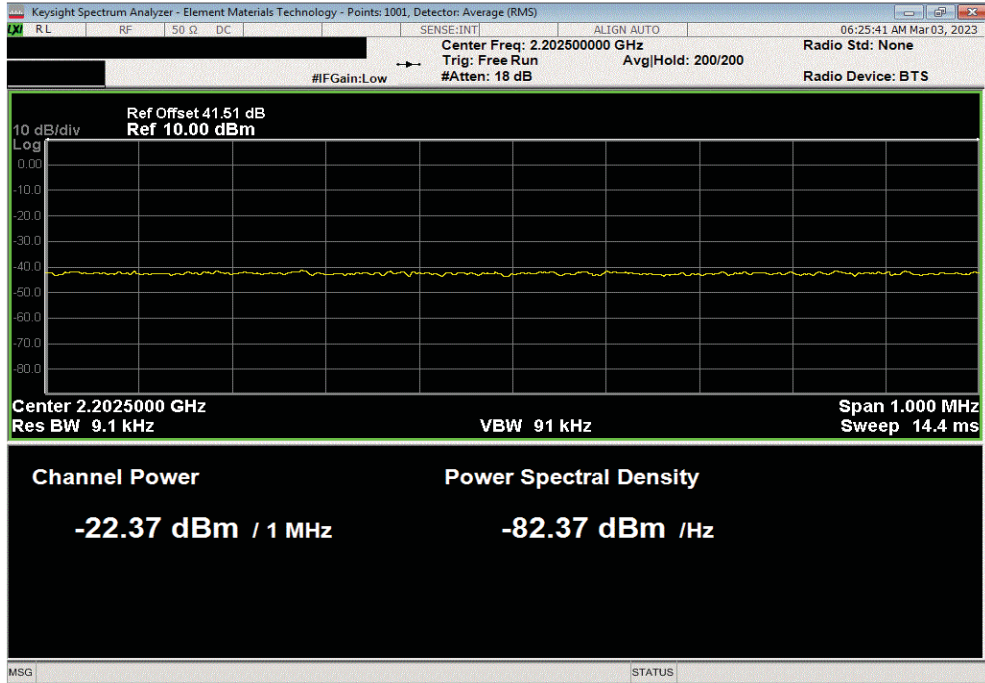


BAND EDGE COMPLIANCE - Band n66 5G

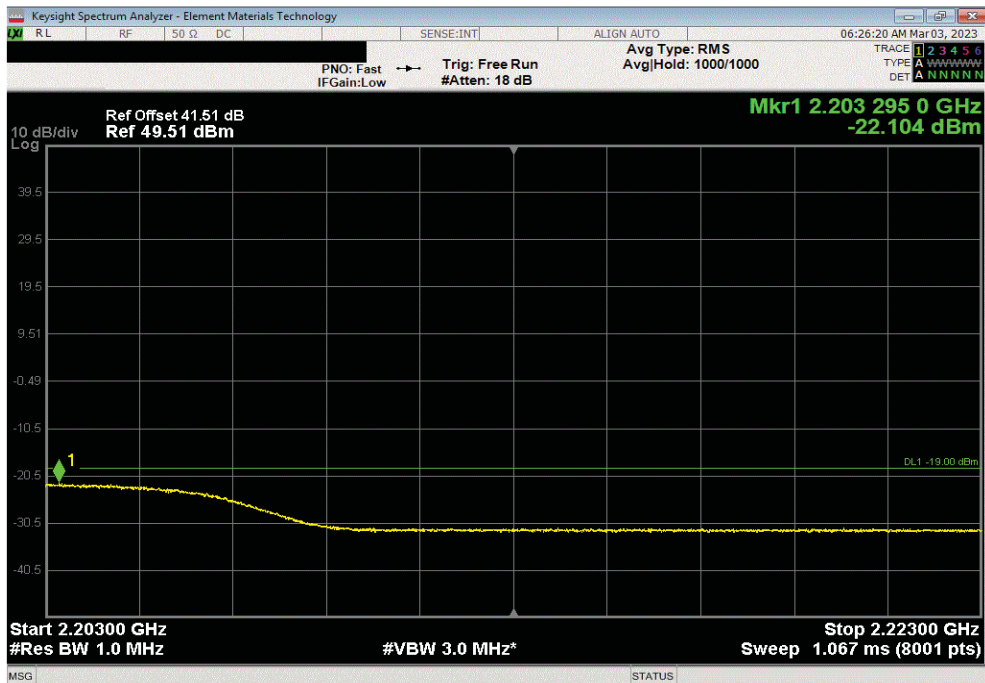


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
6	-22.37	-19	Pass			



Band n66 2110 MHz - 2200 MHz, 5G NR , Port 1, 25 MHz Bandwidth, 256-QAM Modulation, High Channel 2187.5 MHz						
Frequency Range	Max Value (dBm)	Limit < (dBm)	Result			
7	-22.10	-19	Pass			





XMI 2022.12.28.0

BAND EDGE COMPLIANCE - BAND 66 LTE

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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2023-02-09	2024-02-09
Block - DC	Fairview Microwave	SD3239	ANE	2023-02-16	2024-02-16
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

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 with the EUT set to low and high transmit frequencies in the available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

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

All limits were adjusted by a factor of $[-10 \cdot \log(4)]$ dB to account for the device operation as a 4 port MIMO transmitter, as per FCC KDB 622911.

Per section 27.53(h)(1) and RSS-139 6.6, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

Per 27.53(h)(3) and RSS-139 6.6, 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. 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.

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

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, there is significant/good passing margin, and previous compliance testing was successfully performed using a higher average power level. The highest rate modulation type (256QAM) was used. (See ANSI C63.26. clause 5.7.2e).

BAND EDGE COMPLIANCE - BAND 66 LTE



TbTx 2022.05.02.0 XMI 2022.12.28.0

EUT:	Airscale Base Transceiver Station Remote Radio Head Model AHFI1	Work Order:	NOKI0054
Serial Number:	BL2235N41PG	Date:	03/03/2023
Customer:	Nokia of America Corporation	Temperature:	25.1°C
Attendees:	John Rattavong, David Le	Humidity:	35.2%
Project:	None	Barometric Pres.:	983.6 mbar
Tested by:	Brandon Hobbs and Jarrod Brenden	Power:	54 VDC
		Job Site:	TX07

TEST SPECIFICATIONS	Test Method
FCC 27:2023	ANSI C63.26:2015
RSS-139 Issue 4:2022	ANSI C63.26:2015

COMMENTS
All measurement path losses were accounted for in the reference level offset including any attenuators, filters, and DC blocks. The LTE 1.4 MHz carrieris are enabled at 20 watts/carrier.

DEVIATIONS FROM TEST STANDARD
None

Configuration #	NOKI0054-2	Signature	
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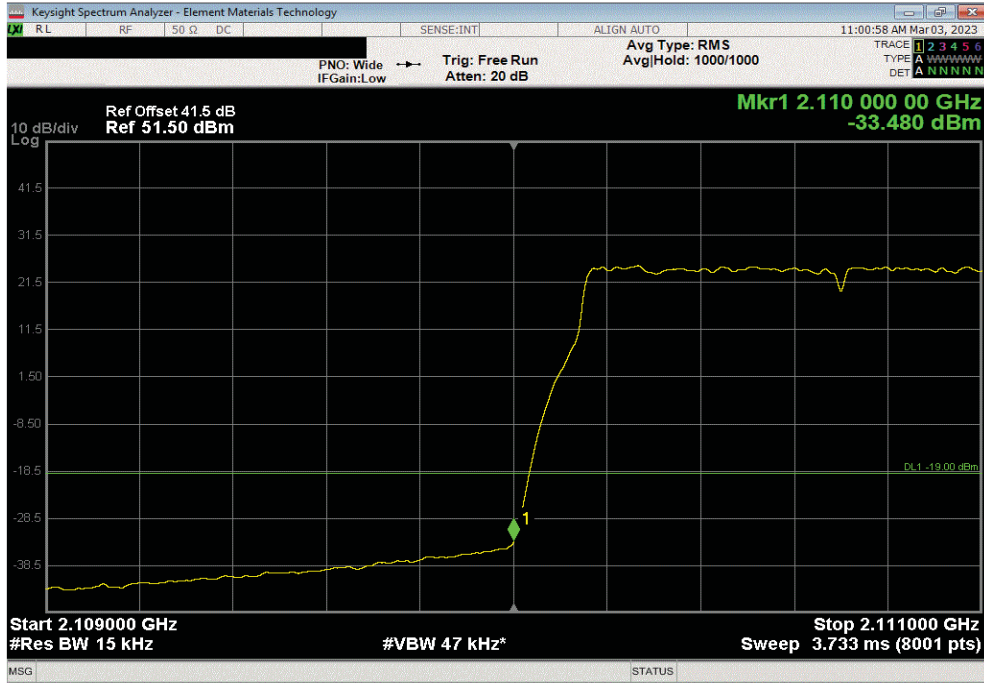
Band	Port	Modulation	Frequency Range	Max Value (dBm)	Limit (dBm)	Result
Band 66	Port 1	256-QAM Modulation				
		1.4 MHz Bandwidth				
		Low Channel 2110.7 MHz	1	-33.5	-19	Pass
		Low Channel 2110.7 MHz	2	-26.3	-19	Pass
		Low Channel 2110.7 MHz	3	-27.3	-19	Pass
		High Channel 2199.3 MHz	1	-32.6	-19	Pass
		High Channel 2199.3 MHz	2	-27.2	-19	Pass
		High Channel 2199.3 MHz	3	-26.8	-19	Pass

BAND EDGE COMPLIANCE - BAND 66 LTE

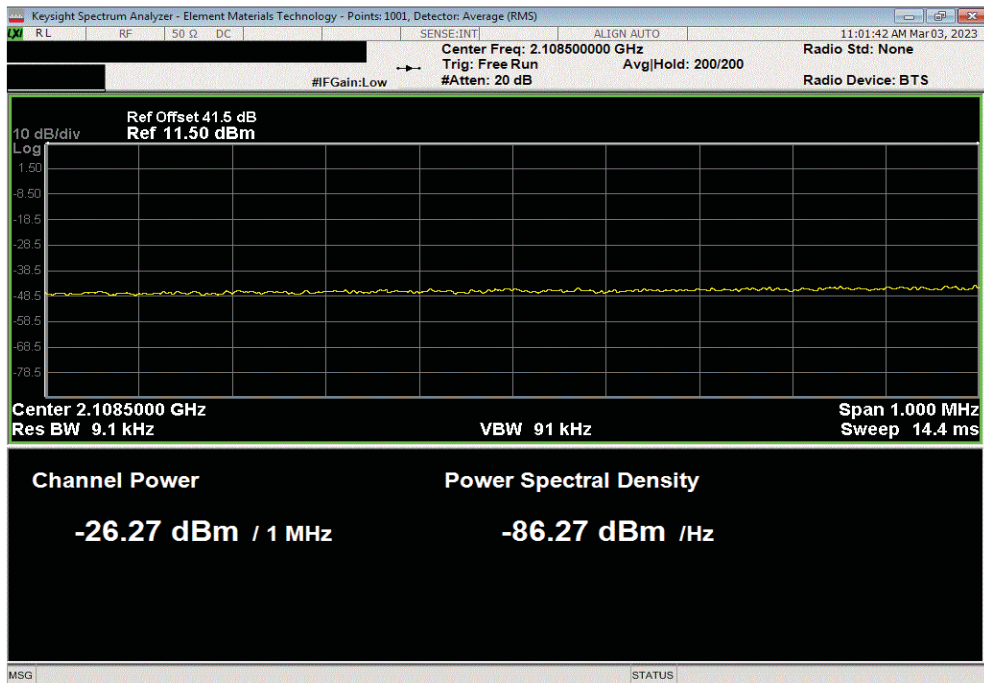


TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 2110.7 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
1	-33.48	-19	Pass			



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, Low Channel 2110.7 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-26.27	-19	Pass			

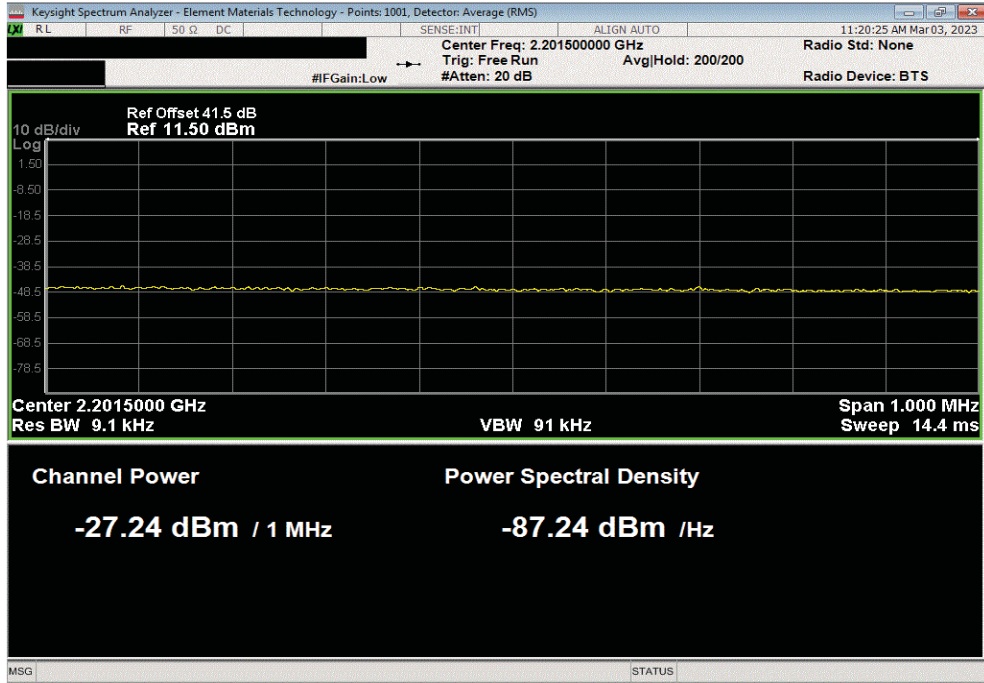


BAND EDGE COMPLIANCE - BAND 66 LTE



TxFx 2022.05.02.0 XMit 2022.12.28.0

Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 2199.3 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
2	-27.24	-19	Pass			



Band 66 2110 MHz - 2200 MHz, LTE , Port 1, 1.4 MHz Bandwidth, 256-QAM Modulation, High Channel 2199.3 MHz						
Frequency Range	Max Value (dBm)	Limit (dBm)	Result			
3	-26.76	-19	Pass			

