



XMH 2022.02.07.0

OUTPUT POWER - ALL PORTS

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
Generator - Signal	Keysight	N5182B	TEV	2021-04-27	2024-04-27
Block - DC	Fairview Microwave	SD3379	AMM	2021-09-14	2022-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

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 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 total average transmit power of all antenna ports was determined per ANSI C63.26-2105 paragraph 6.4.3.1.

OUTPUT POWER - ALL PORTS



TelTx 2021.12.14.1 XMit 2022.02.07.0

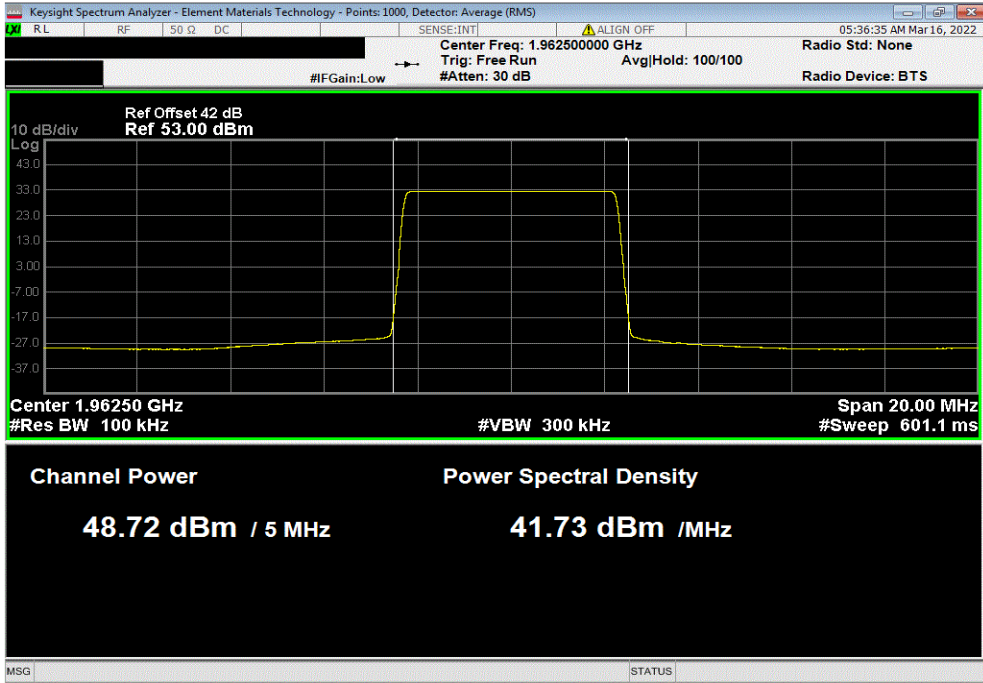
EUT: AHFII Remote Radio Head		Work Order: NOKI0038					
Serial Number: YK214000035		Date: 16-Mar-22					
Customer: Nokia of America Corporation		Temperature: 22.6 °C					
Attendees: Mitchell Hill		Humidity: 23.7% RH					
Project: None		Barometric Pres.: 1026 mbar					
Tested by: Mark Baytan		Power: 54 VDC					
Job Site: TX09							
TEST SPECIFICATIONS							
FCC 24E:2022		ANSI C63.26:2015					
RSS-133 Issue 6:2013+A1:2018		RSS-133 Issue 6:2013+A1:2018					
COMMENTS							
All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. Band n25 and n66 carriers are enabled at maximum power (PCS:80 watts/carrier, AWS:40 watts/carrier).							
DEVIATIONS FROM TEST STANDARD							
None							
Configuration #	2	Signature 					
		Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports (dBm)	Limit	Results
Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W)							
Port 1							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 1962.5 MHz							
		48.717	0	48.7	N/A	Inside Tolerance	N/A
Port 2							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 1962.5 MHz							
		48.877	0	48.9	N/A	Inside Tolerance	N/A
Port 3							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 1962.5 MHz							
		48.832	0	48.8	N/A	Inside Tolerance	N/A
Port 4							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 1962.5 MHz							
		48.57	0	48.6	N/A	Inside Tolerance	N/A
Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W)							
Port 1							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 2155 MHz							
		45.797	0	45.8	N/A	Inside Tolerance	N/A
Port 2							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 2155 MHz							
		45.77	0	45.8	N/A	Inside Tolerance	N/A
Port 3							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 2155 MHz							
		45.876	0	45.9	N/A	Inside Tolerance	N/A
Port 4							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel, 2155 MHz							
		45.929	0	45.9	N/A	Inside Tolerance	N/A
Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W) and Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W)							
All Ports							
5 MHz Bandwidth							
256-QAM Modulation							
Mid Channel							
		N/A	0	N/A	56.6	N/A	N/A

OUTPUT POWER - ALL PORTS

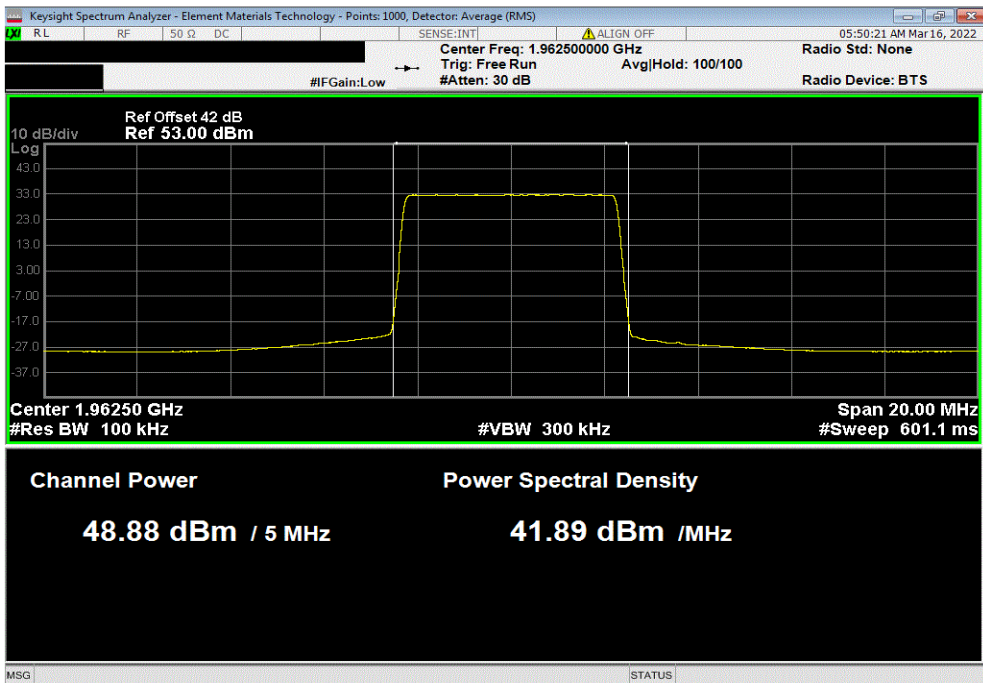


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Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W), Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
48.717	0	48.7	N/A	Inside Tolerance	N/A	



Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W), Port 2, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
48.877	0	48.9	N/A	Inside Tolerance	N/A	

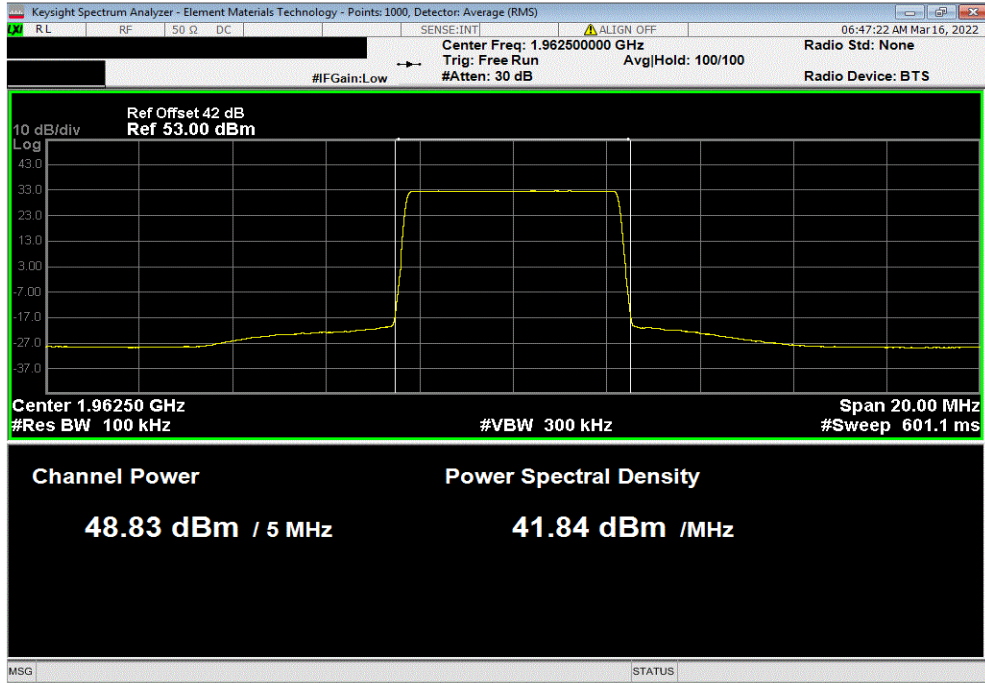


OUTPUT POWER - ALL PORTS

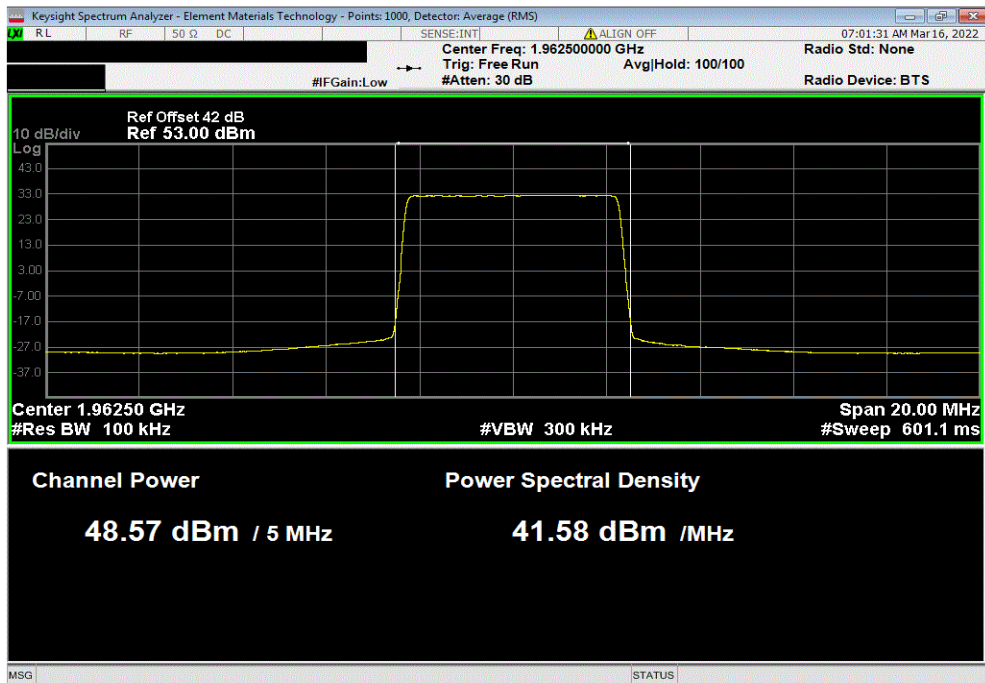


TuTx 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W), Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
48.832	0	48.8	N/A	Inside Tolerance	N/A	



Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W), Port 4, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
48.57	0	48.6	N/A	Inside Tolerance	N/A	

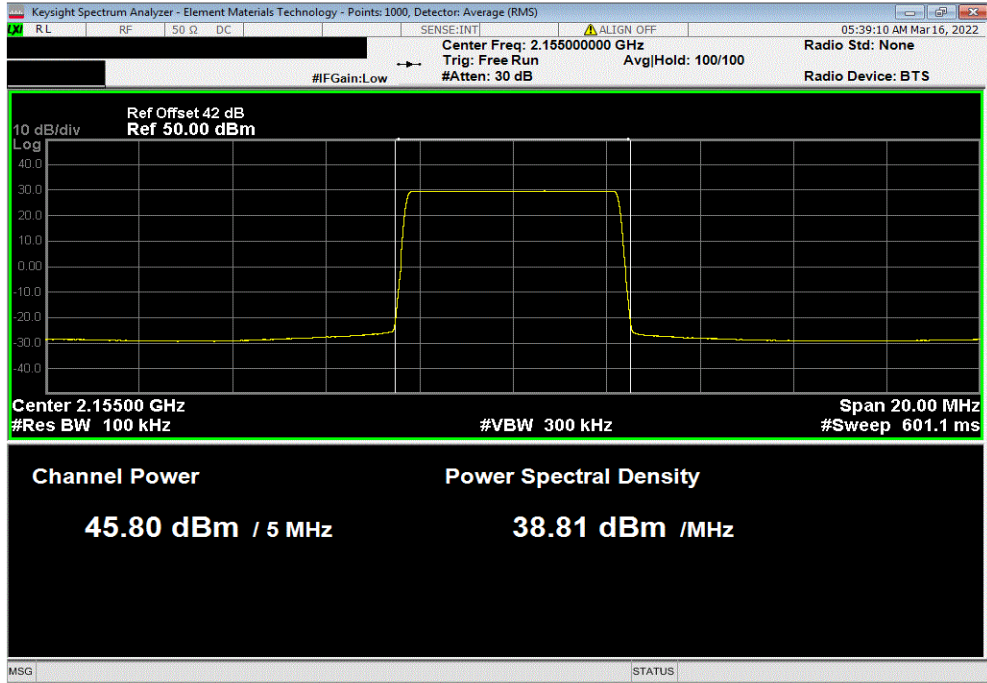


OUTPUT POWER - ALL PORTS

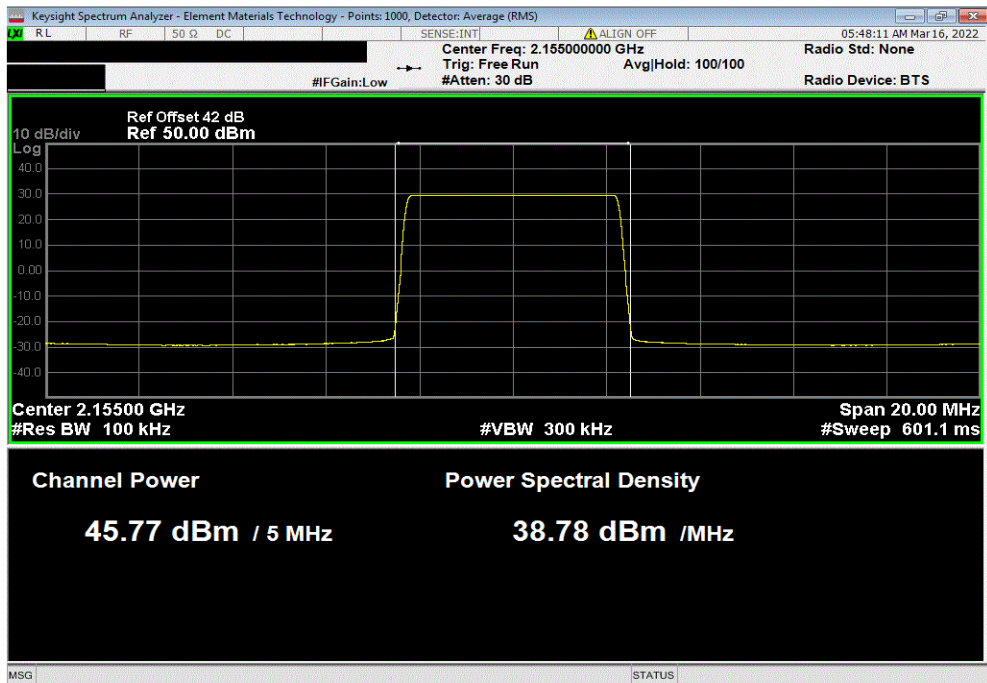


TuTx 2021.12.14.1 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W), Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
45.797	0	45.8	N/A	Inside Tolerance	N/A	



Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W), Port 2, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
45.77	0	45.8	N/A	Inside Tolerance	N/A	

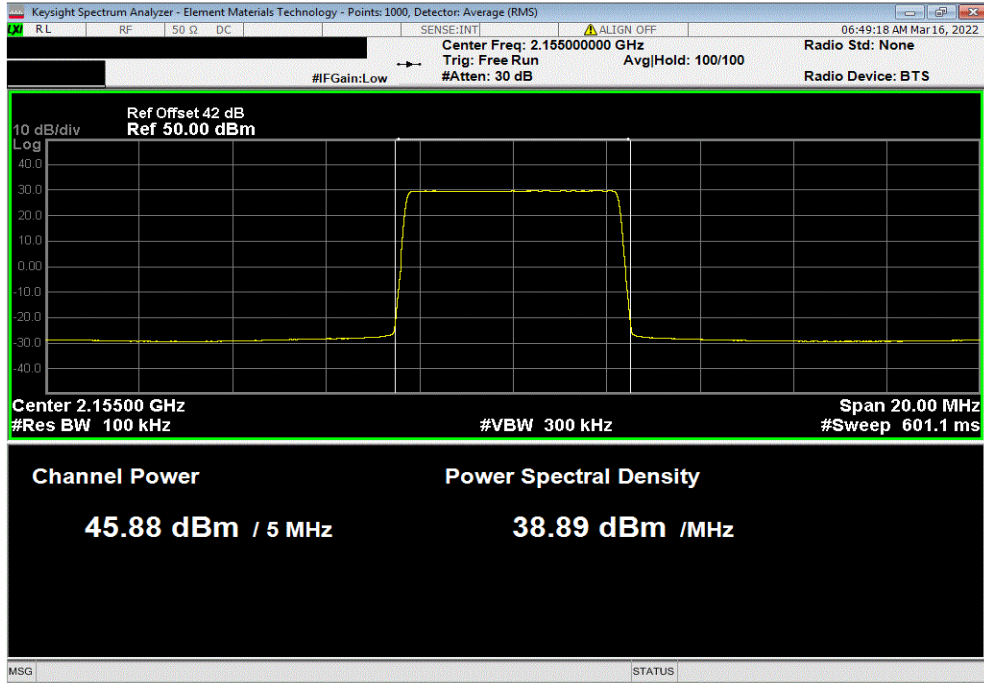


OUTPUT POWER - ALL PORTS

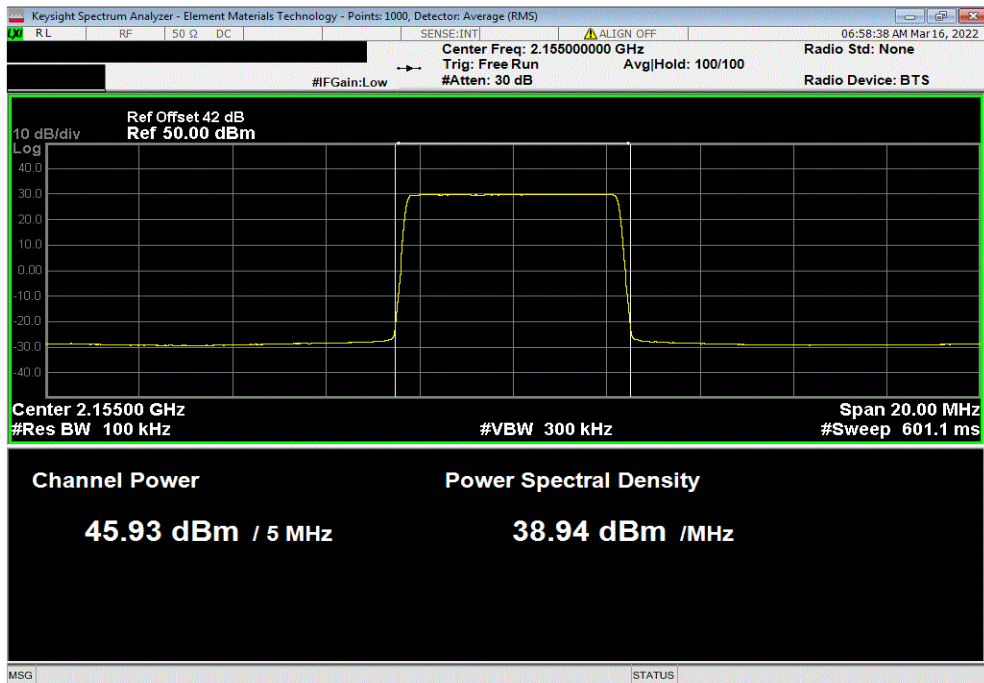


TbTx 2021.12.14.1 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W), Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
45.876	0	45.9	N/A	Inside Tolerance	N/A	



Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W), Port 4, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	All Ports	Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW	(dBm)			
45.929	0	45.9	N/A	Inside Tolerance	N/A	



OUTPUT POWER - ALL PORTS



TbTx 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 80W) and Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 40W), All Ports, 5 MHz Bandwidth, 256-QAM Modulation						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports (dBm)	Limit	Results
	N/A	0	N/A	N/A	N/A	N/A

BAND N25 - AVERAGE PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	48.7	48.9	48.8	48.6	N/A
INITIAL VALUE (Watts)	74.1	77.6	75.9	72.4	300
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	54.8


BAND N66 - AVERAGE PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	45.8	45.8	45.9	45.9	N/A
INITIAL VALUE (Watts)	74.1	77.6	75.9	72.4	154
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	51.9

BAND N25 & N66 - AVERAGE PORT SUMMING			
	BAND N25	BAND N66	SUM TOTAL
INITIAL VALUE (dBm)	54.8	51.9	N/A
INITIAL VALUE (Watts)	300	154	454
TOTAL VALUE (dBm)	N/A	N/A	56.6

OUTPUT POWER (ALL PORTS)



TbTx 2021.12.14.1 XMi 2022.02.07.0

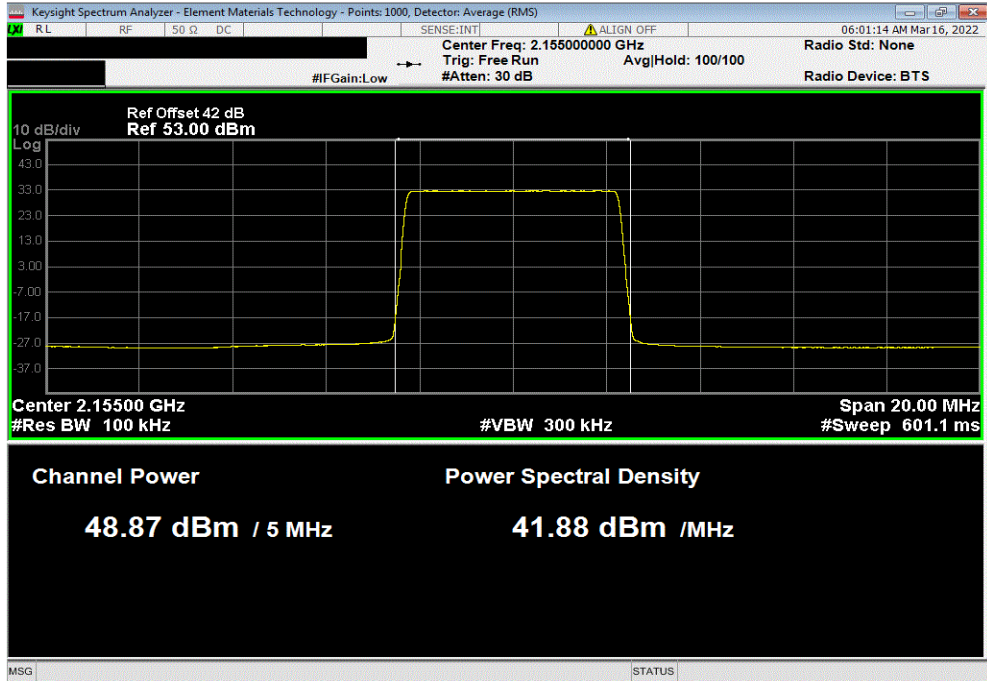
EUT: AHFII Remote Radio Head		Work Order: NOKI0038	
Serial Number: YK21400035		Date: 16-Mar-22	
Customer: Nokia of America Corporation		Temperature: 22.6 °C	
Attendees: Mitchell Hill		Humidity: 23.7% RH	
Project: None		Barometric Pres.: 1026 mbar	
Tested by: Mark Baytan		Power: 54 VDC	
Job Site: TX09			
TEST SPECIFICATIONS		Test Method	
FCC 24E:2022		ANSI C63.26:2015	
RSS-139 Issue 3:2015		RSS-139 Issue 3:2015	
RSS-170 Issue 3:2015		RSS-170 Issue 3:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. Band n25 and n66 carriers are enabled at maximum power (AWS:80 watts/carrier, PCS:40 watts/carrier).			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature 	
		Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)
		Single Port dBm/Carrier BW	Limit
			Results
Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W)			
Port 1			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 2155 MHz			
		48.872	0
		48.9	Inside Tolerance
			N/A
Port 2			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 2155 MHz			
		48.745	0
		48.7	Inside Tolerance
			N/A
Port 3			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 2155 MHz			
		48.705	0
		48.7	Inside Tolerance
			N/A
Port 4			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 2155 MHz			
		48.83	0
		48.8	Inside Tolerance
			N/A
Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W)			
Port 1			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 1962.5 MHz			
		45.809	0
		45.8	Inside Tolerance
			N/A
Port 2			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 1962.5 MHz			
		45.876	0
		45.9	Inside Tolerance
			N/A
Port 3			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 1962.5 MHz			
		45.744	0
		45.7	Inside Tolerance
			N/A
Port 4			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel, 1962.5 MHz			
		45.529	0
		45.5	Inside Tolerance
			N/A
Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W) and Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W)			
All Ports			
5 MHz Bandwidth			
256-QAM Modulation			
Mid Channel			
		N/A	0
		N/A	N/A
		56.6	N/A
			N/A

OUTPUT POWER (ALL PORTS)

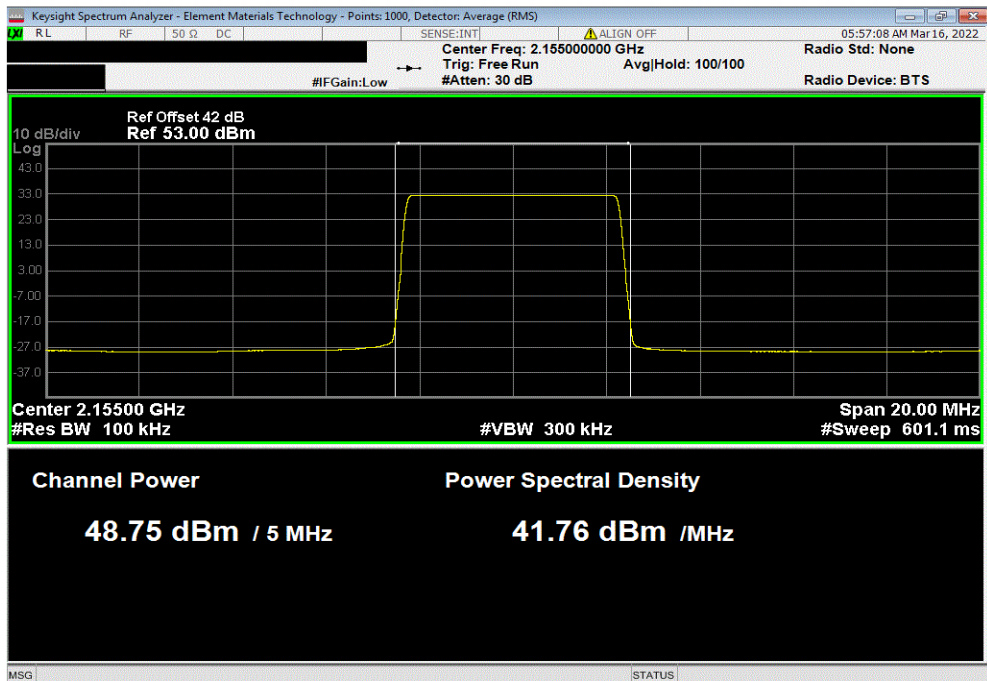


TuTx 2021.12.14.1 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W), Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
48.872	0	48.9		Inside Tolerance	N/A	



Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W), Port 2, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
48.745	0	48.7		Inside Tolerance	N/A	

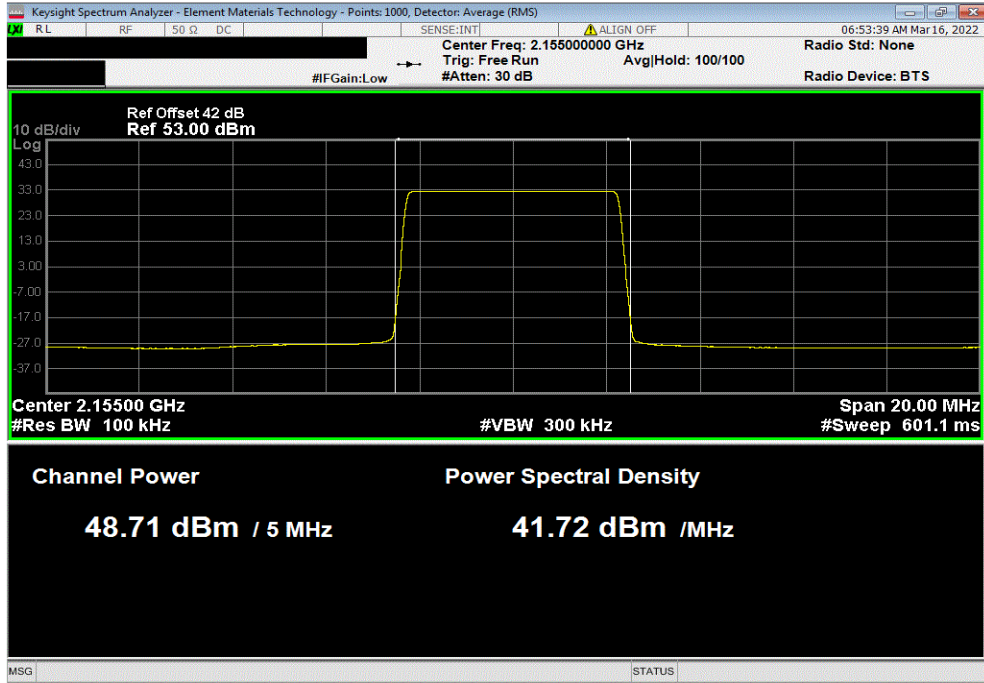


OUTPUT POWER (ALL PORTS)

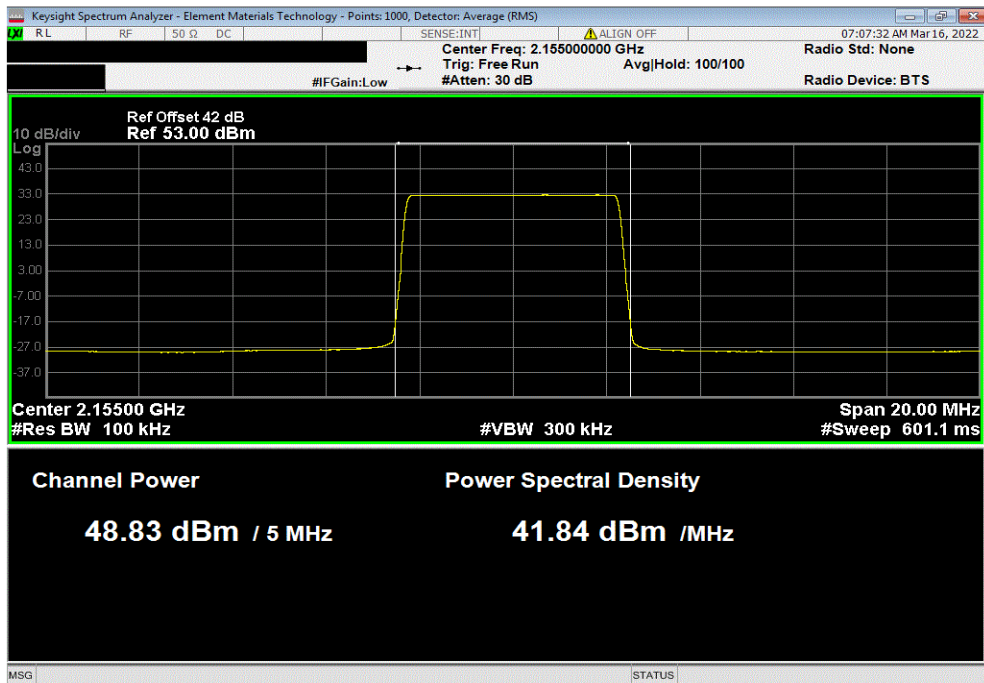


TuTx 2021.12.14.1 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W), Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
48.705	0	48.7		Inside Tolerance	N/A	



Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W), Port 4, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
48.83	0	48.8		Inside Tolerance	N/A	

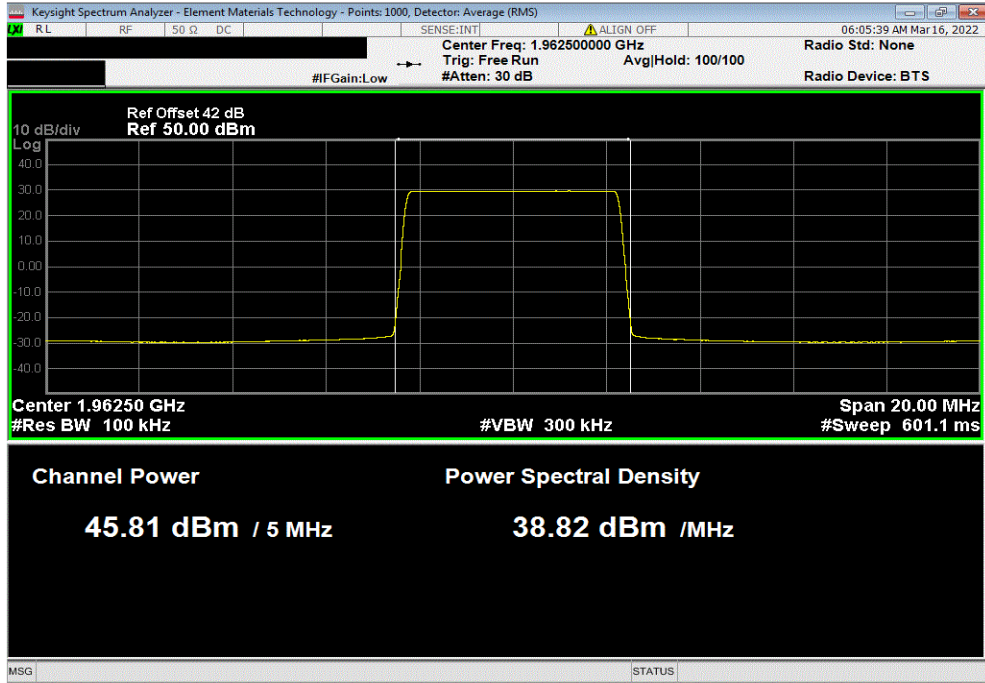


OUTPUT POWER (ALL PORTS)

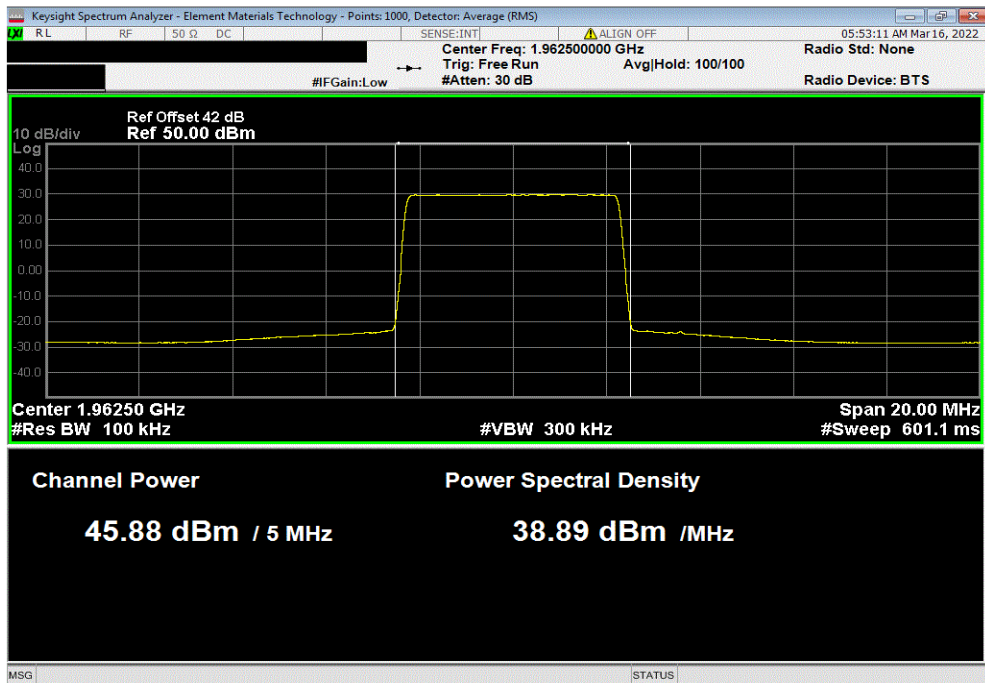


TuTx 2021.12.14.1 XMt 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W), Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
45.809	0	45.8		Inside Tolerance	N/A	



Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W), Port 2, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
45.876	0	45.9		Inside Tolerance	N/A	



OUTPUT POWER (ALL PORTS)

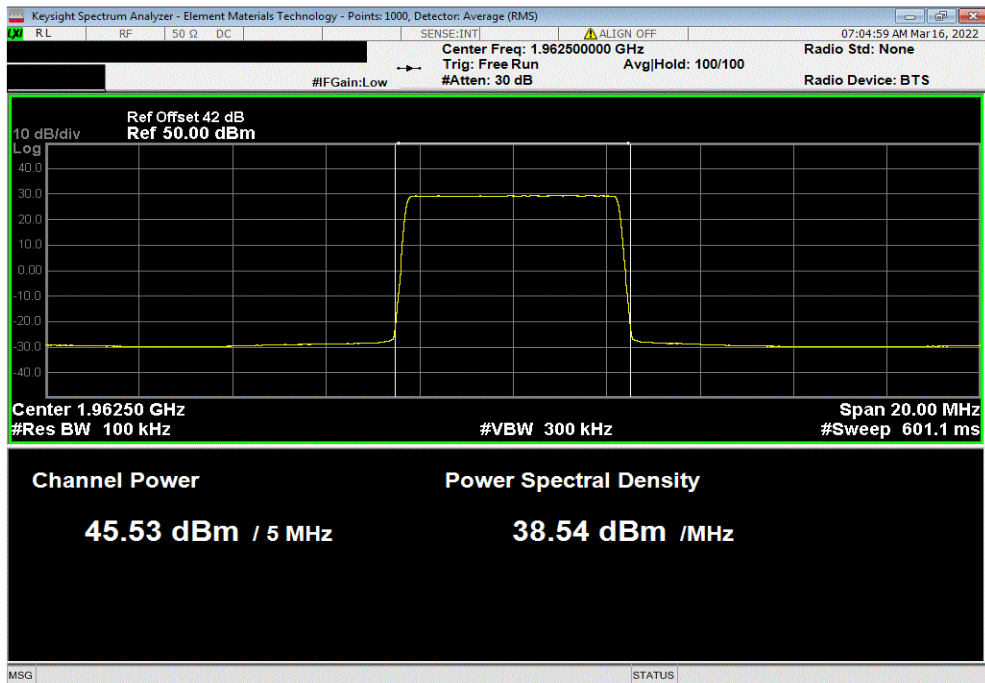


TuTx 2021.12.14.1 XMi 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W), Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
45.744	0	45.7		Inside Tolerance	N/A	



Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W), Port 4, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port		Limit	Results	
dBm/Carrier BW	Factor (dB)	dBm/Carrier BW				
45.529	0	45.5		Inside Tolerance	N/A	



OUTPUT POWER - ALL PORTS



TbTx 2021.12.14.1 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR (Power: 80W) and Band n25, 1930 MHz - 1995 MHz, 5G NR (Power: 40W), All Ports, 5 MHz Bandwidth, 256-QAM Modulation						
	Initial Value dBm/Carrier BW	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	All Ports (dBm)	Limit	Results
	N/A	0	N/A	N/A	N/A	N/A

BAND N66 - AVERAGE PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	48.9	48.7	48.7	48.8	N/A
INITIAL VALUE (Watts)	77.6	74.1	74.1	75.9	302
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	54.8

BAND N25 - AVERAGE PORT SUMMING					
	PORT 1	PORT 2	PORT 3	PORT 4	SUM TOTAL
INITIAL VALUE (dBm)	45.8	45.9	45.7	45.5	N/A
INITIAL VALUE (Watts)	38.0	38.9	37.2	35.5	150
TOTAL VALUE (dBm)	N/A	N/A	N/A	N/A	51.8

BAND N25 & N66 - AVERAGE PORT SUMMING			
	BAND N25	BAND N66	SUM TOTAL
INITIAL VALUE (dBm)	54.8	51.8	N/A
INITIAL VALUE (Watts)	302	150	452
TOTAL VALUE (dBm)	N/A	N/A	56.6

POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



element

XMR 2022.02.07.0

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
Generator - Signal	Keysight	N5182B	TEV	2021-04-27	2024-04-27
Block - DC	Fairview Microwave	SD3379	AMM	2021-09-14	2022-09-14
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFQ	2022-01-17	2023-01-17

TEST DESCRIPTION

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

The method of ANSI C63.26-2015 section 5.2.4.5 was used to make this measurement.

The RF conducted emission testing was performed on one port. The AHFII antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in the "Output Power - All Ports" report section) 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 PSD for all antenna ports (at the radio output) were determined per ANSI C63.26-2015 paragraph 6.4.3.2.4. The EIRP calculations are based upon ANSI C63.26-2015 paragraphs 6.4 and 6.4.6.3.

EIRP Requirements:

FCC Requirements: Part 24.232 Power and antenna height limits.

- (a)(2) Base stations with an emission bandwidth greater than 1 MHz are limited to 1640 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT, except as described in paragraph (b) below.
- a)(3) Base station antenna heights may exceed 300 meters HAAT with a corresponding reduction in power; see Tables 1 and 2 of this section.
- b)(2) Base stations that are located in counties with population densities of 100 persons or fewer per square mile, based upon the most recently available population statistics from the Bureau of the Census, with an emission bandwidth greater than 1 MHz are limited to 3280 watts/MHz equivalent isotropically radiated power (EIRP) with an antenna height up to 300 meters HAAT.

ISED Requirements RSS-133 Section 6.4/SRSP-510 section 5.1.1:

SRSP-510 section 5.1 Radiated power and antenna height limits for base stations

For base stations with a channel bandwidth greater than 1 MHz, the maximum e.i.r.p. is limited to 3280 watts/MHz e.i.r.p. (i.e., no more than 3280 watts e.i.r.p. in any 1 MHz band segment) with an antenna height above average terrain (HAAT) up to 300 metres. Fixed or base stations operating in urban areas are limited to a maximum allowable e.i.r.p. of 1640 watts/MHz e.i.r.p. Base station antenna heights above average terrain may exceed 300 metres with a corresponding reduction in e.i.r.p. according to the following table:

FCC Requirements: Part 27.50(d)

The following power and antenna height requirements apply to stations transmitting in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz and 2180-2200 MHz bands:

(1) The power of each fixed or base station transmitting in the 1995-2000 MHz, 2110-2155 MHz, 2155-2180 MHz or 2180-2200 MHz band and located in any county with population density of 100 or fewer persons per square mile, based upon the most recently available population statistics from the Bureau of the Census, is limited to:

(ii) An EIRP of 3280 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

(2) The power of each fixed or base station transmitting in the 1695-2000 MHz, the 2110-2155 MHz 2155-2180 MHz band, or 2180-2200 MHz band and situated in any geographic location other than that described in paragraph (d)(1) of this section is limited to:

(ii) An EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

ISED Requirements for the AWS Band are provided in RSS-139 Section 6.5/SRSP-513 Section 5.1.1 and RSS-170 Section 5.3.1/SRSP-519 Section 5.1

POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



TbTts 2021.12.14.1 XMW 2022.02.07.0

EUT: AHFII Remote Radio Head		Work Order: NOKI0038	
Serial Number: YK214000035		Date: 18-Mar-22	
Customer: Nokia of America Corporation		Temperature: 22.7 °C	
Attendees: Mitchell Hill		Humidity: 25% RH	
Project: None		Barometric Pres.: 1024 mbar	
Tested by: Brandon Hobbs		Job Site: TX06	
Power: 54 VDC			
TEST SPECIFICATIONS		Test Method	
FCC 24E:2022		ANSI C63.26:2015	
RSS-133 Issue 6:2013+A1:2018		RSS-133 Issue 6:2013+A1:2018	
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 at maximum power (80 watts/carrier). The PSD was measured while transmitting one carrier on Port 1. The total PSD for multipoint (2x2 MIMO, 4x4 MIMO) operation was determined based upon ANSI 63.26 clause 6.4.3.2.4 (10 Log Nout). The total PSD for two port operation is single port PSD +3dB [i.e. 10 Log(2)]. The total PSD for four port operation is single port PSD +6dB [i.e. 10 Log(4)].			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature	

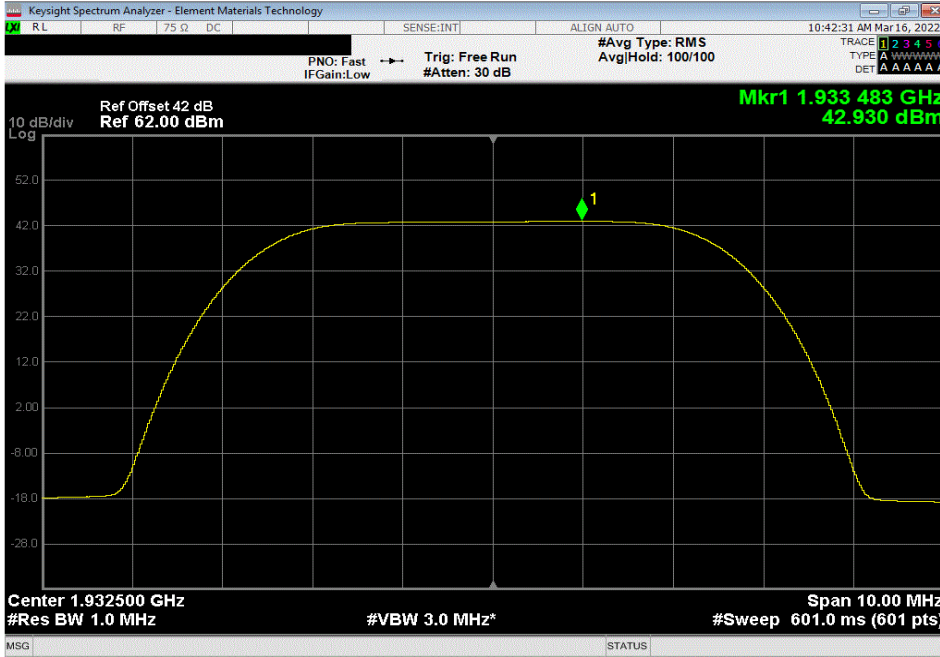
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/MHz == PSD	Two Port (2x2 MIMO) dBm/MHz == PSD	Four Port (4x4 MIMO) dBm/MHz == PSD
Band n25, 1930 MHz - 1995 MHz, 5G NR					
Port 1					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 1932.5 MHz	42.930	0	42.9	45.9	48.9
Mid Channel, 1962.5 MHz	42.816	0	42.8	45.8	48.8
High Channel, 1992.5 MHz	42.770	0	42.8	45.8	48.8
16-QAM Modulation					
Low Channel, 1932.5 MHz	42.917	0	42.9	45.9	48.9
Mid Channel, 1962.5 MHz	42.802	0	42.8	45.8	48.8
High Channel, 1992.5 MHz	42.764	0	42.8	45.8	48.8
64-QAM Modulation					
Low Channel, 1932.5 MHz	42.965	0	43.0	46.0	49.0
Mid Channel, 1962.5 MHz	42.816	0	42.8	45.8	48.8
High Channel, 1992.5 MHz	42.807	0	42.8	45.8	48.8
256-QAM Modulation					
Low Channel, 1932.5 MHz	42.981	0	43.0	46.0	49.0
Mid Channel, 1962.5 MHz	42.858	0	42.9	45.9	48.9
High Channel, 1992.5 MHz	42.820	0	42.8	45.8	48.8
10 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 1962.5 MHz	39.651	0	39.7	42.7	45.7
16-QAM Modulation					
Mid Channel, 1962.5 MHz	40.307	0	40.3	43.3	46.3
64-QAM Modulation					
Mid Channel, 1962.5 MHz	39.658	0	39.7	42.7	45.7
256-QAM Modulation					
Mid Channel, 1962.5 MHz	39.667	0	39.7	42.7	45.7
15 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 1962.5 MHz	37.852	0	37.9	40.9	43.9
16-QAM Modulation					
Mid Channel, 1962.5 MHz	39.383	0	39.4	42.4	45.4
64-QAM Modulation					
Mid Channel, 1962.5 MHz	37.893	0	37.9	40.9	43.9
256-QAM Modulation					
Mid Channel, 1962.5 MHz	37.880	0	37.9	40.9	43.9
20 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 1962.5 MHz	36.668	0	36.7	39.7	42.7
16-QAM Modulation					
Mid Channel, 1962.5 MHz	38.324	0	38.3	41.3	44.3
64-QAM Modulation					
Mid Channel, 1962.5 MHz	36.691	0	36.7	39.7	42.7
256-QAM Modulation					
Mid Channel, 1962.5 MHz	36.734	0	36.7	39.7	42.7
30 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 1962.5 MHz	34.888	0	34.9	37.9	40.9
16-QAM Modulation					
Mid Channel, 1962.5 MHz	36.586	0	36.6	39.6	42.6
64-QAM Modulation					
Mid Channel, 1962.5 MHz	34.970	0	35.0	38.0	41.0
256-QAM Modulation					
Mid Channel, 1962.5 MHz	34.922	0	34.9	37.9	40.9

POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

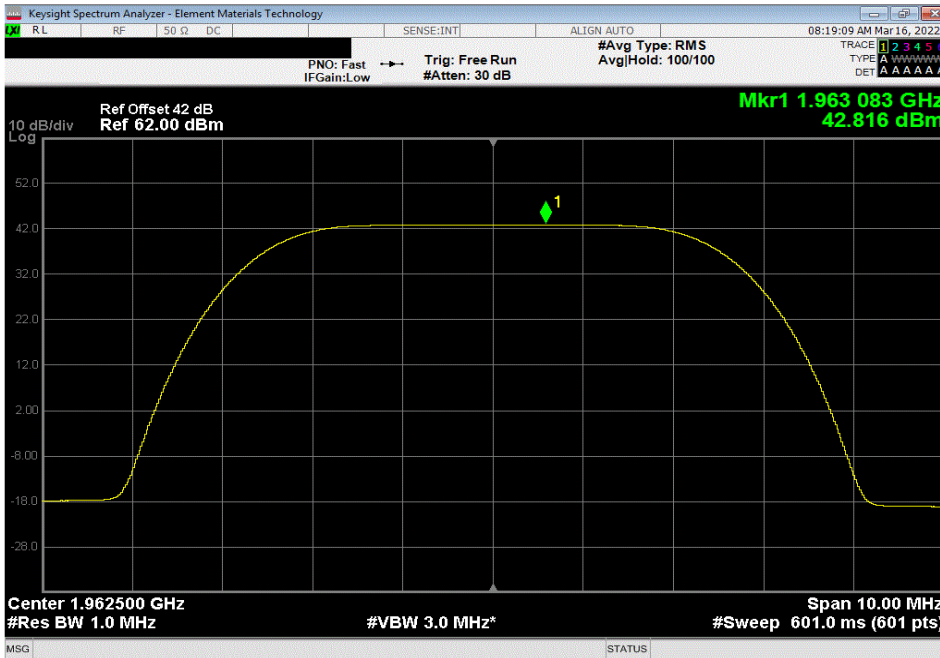


Tbft v 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 1932.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.93	0	42.93	45.93	48.93	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.816	0	42.816	45.816	48.816	

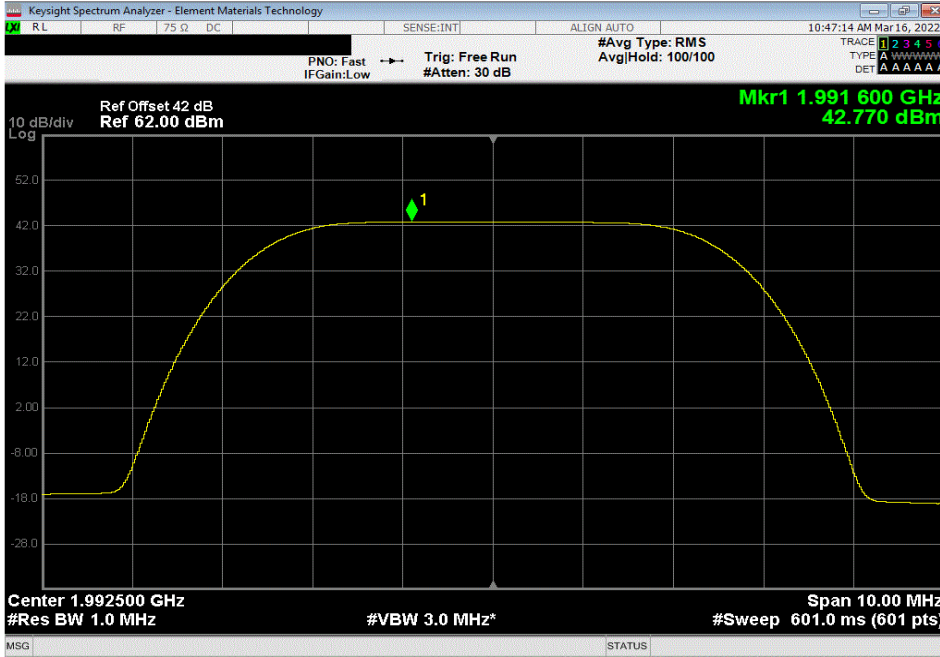


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

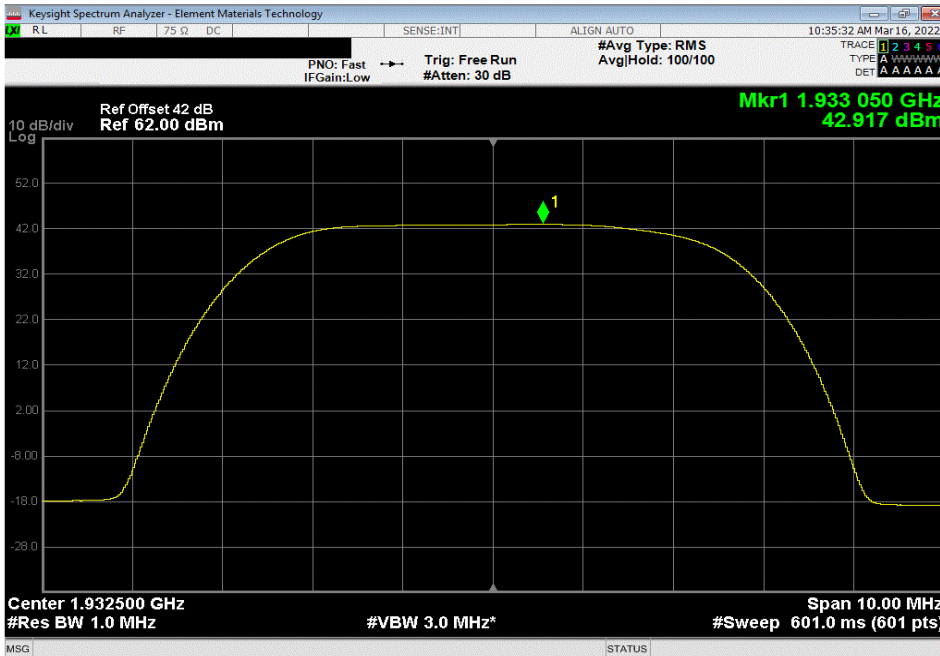


Tbft v 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, High Channel, 1992.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.77	0	42.77	45.77	48.77	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, Low Channel, 1932.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.917	0	42.917	45.917	48.917	

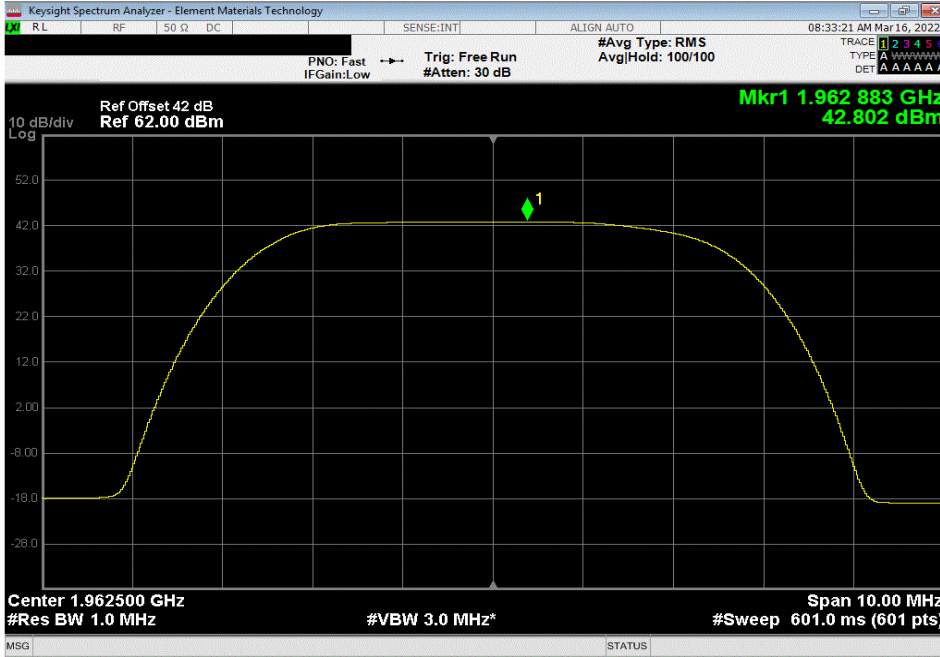


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

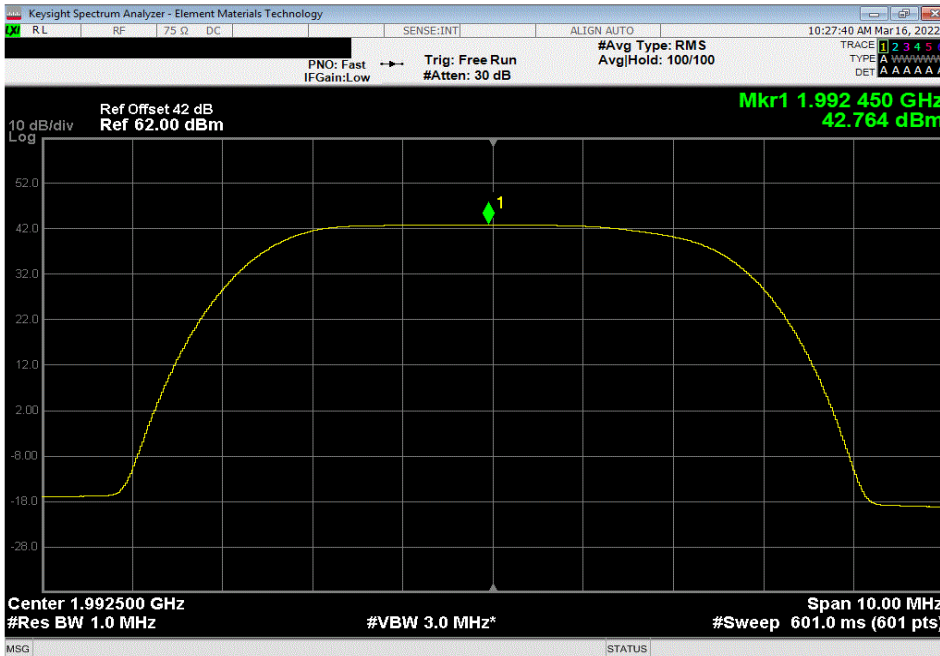


Tbft v 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.802	0	42.802	45.802	48.802	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, High Channel, 1992.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.764	0	42.764	45.764	48.764	

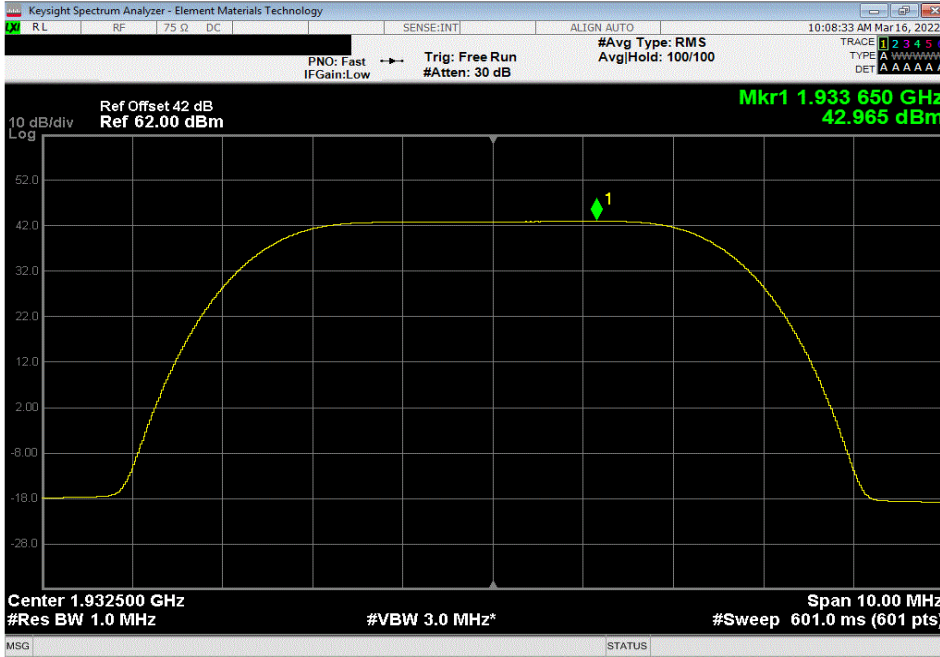


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

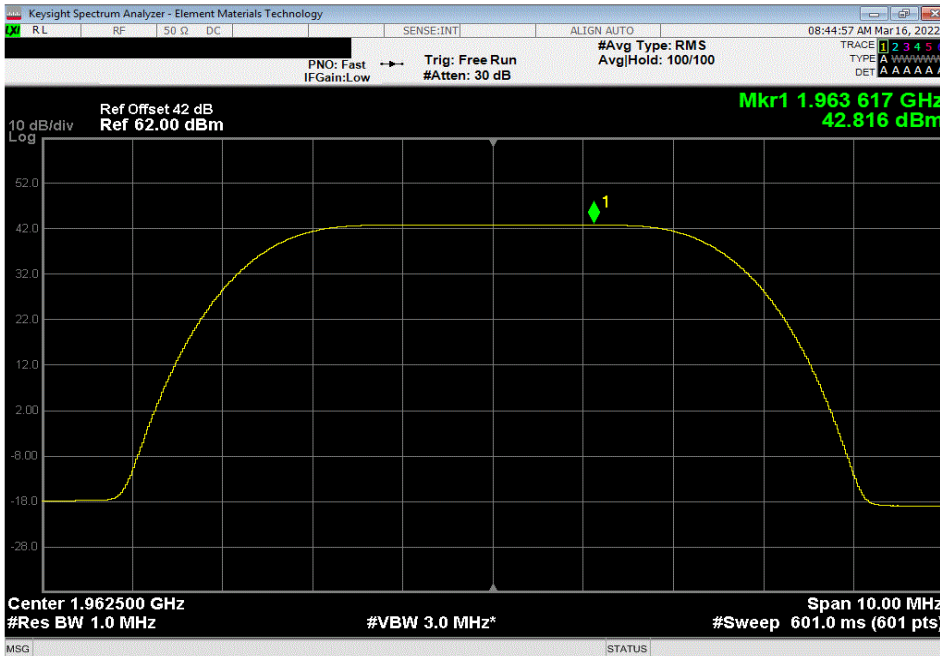


Tbft v 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, Low Channel, 1932.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.965	0	42.965	45.965	48.965	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.816	0	42.816	45.816	48.816	

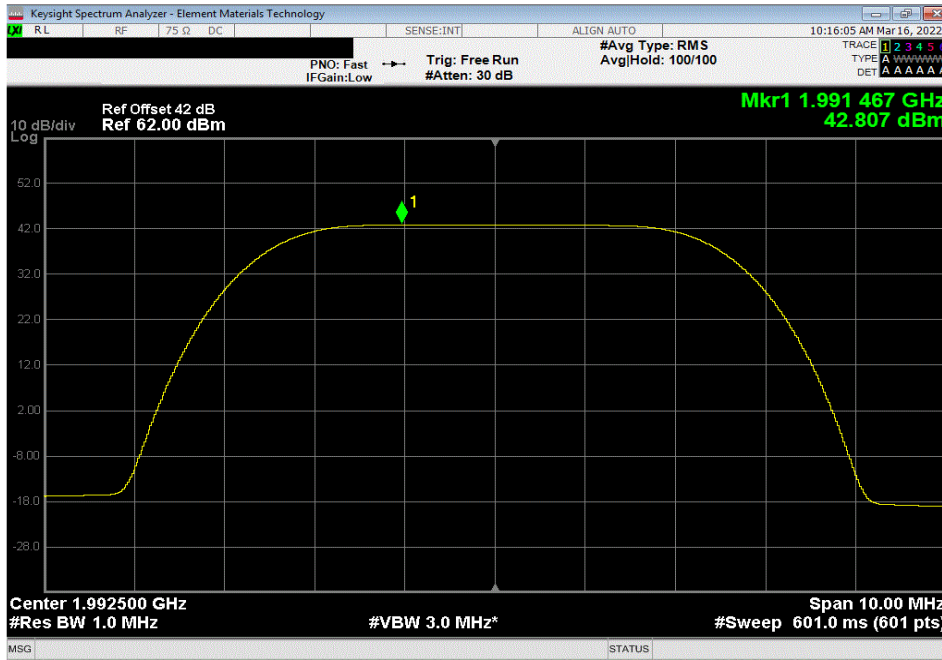


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

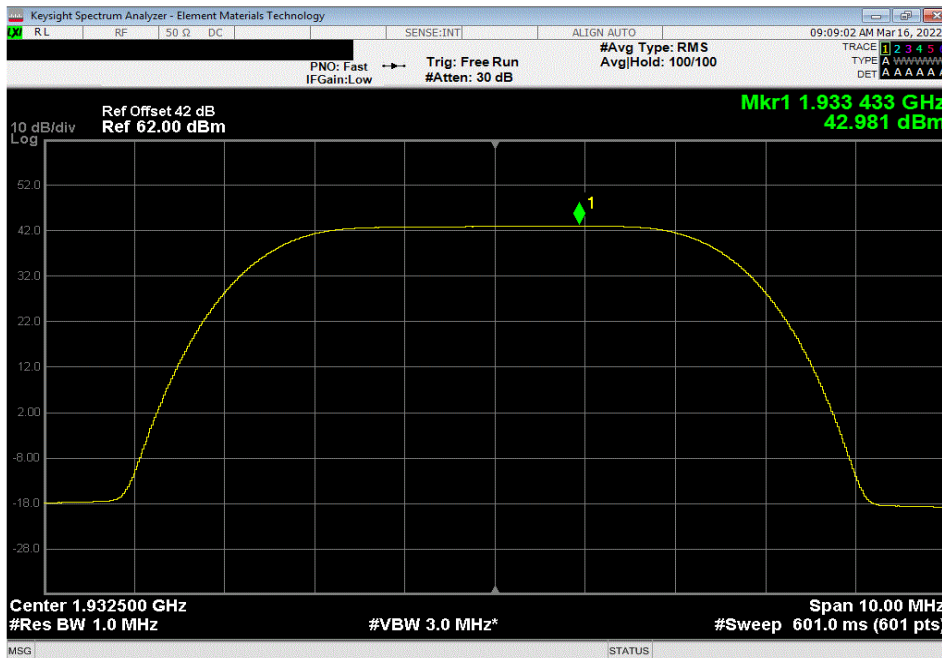


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, High Channel, 1992.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.807	0	42.807	45.807	48.807	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Low Channel, 1932.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.981	0	42.981	45.981	48.981	

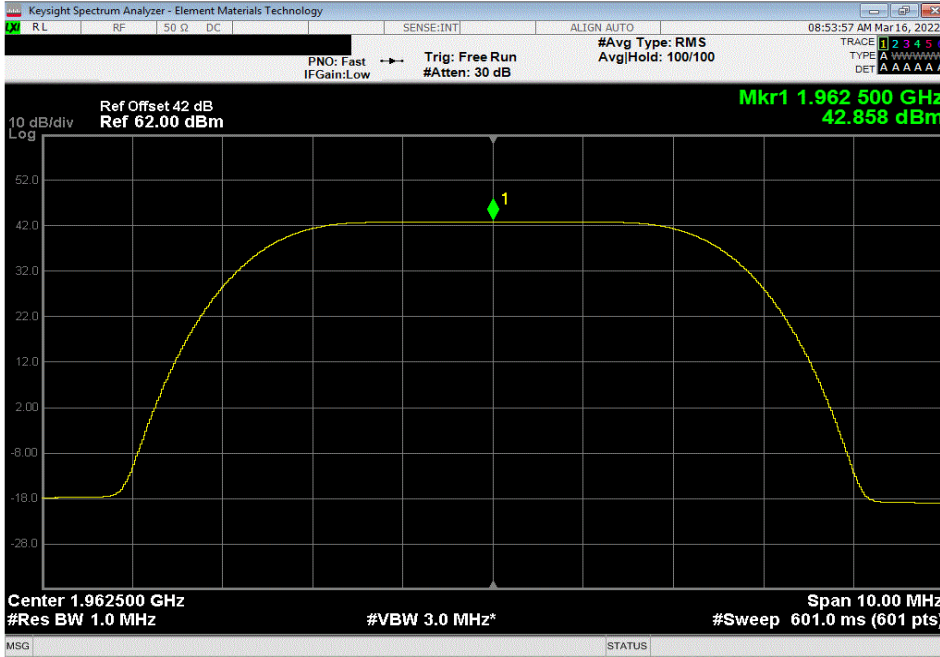


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

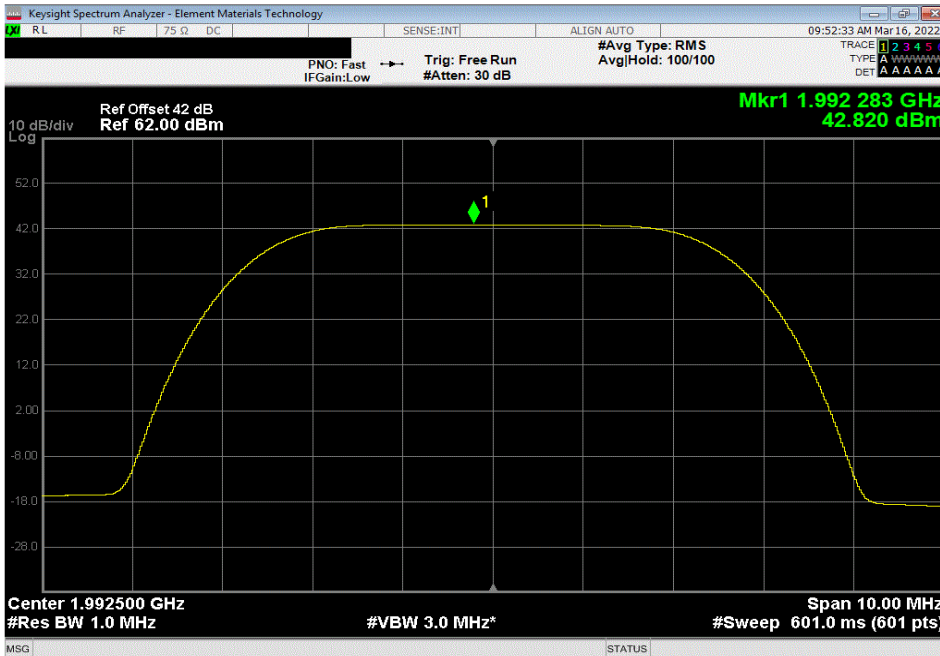


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.858	0	42.858	45.858	48.858	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, High Channel, 1992.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	42.82	0	42.82	45.82	48.82	

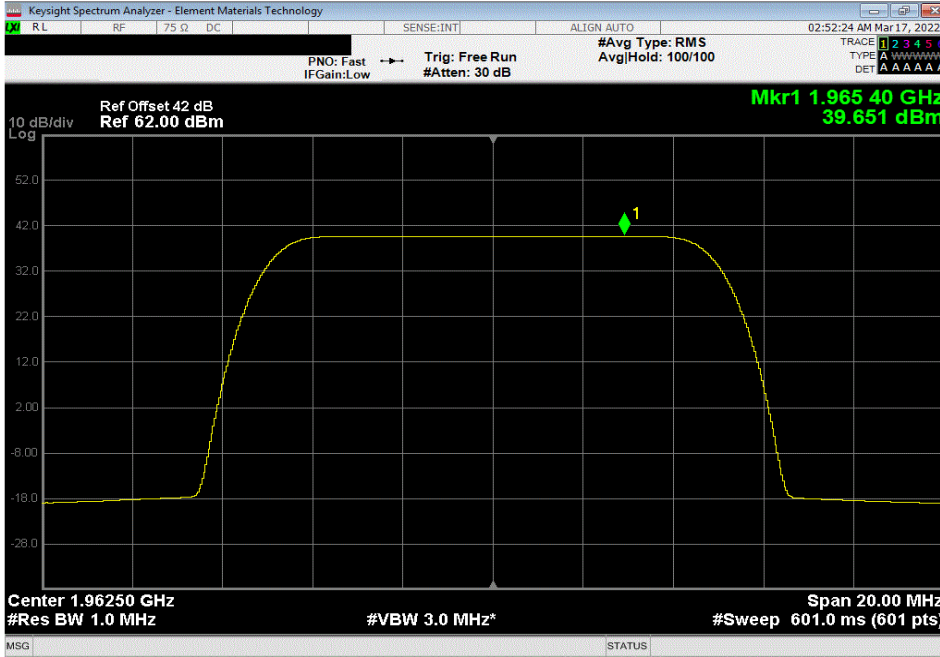


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

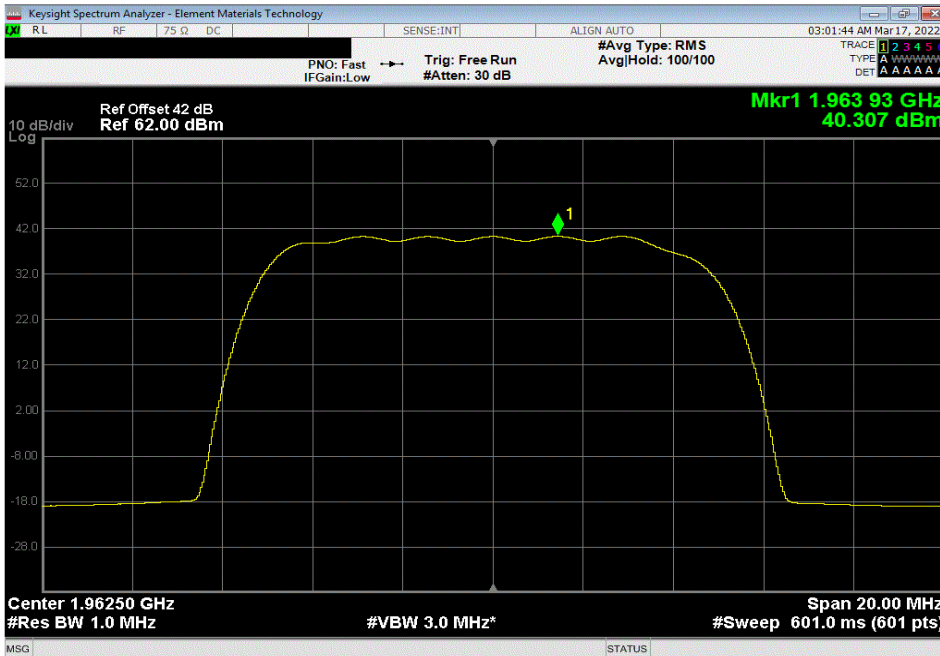


TbT 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD		
39.651	0	39.651	42.651	45.651		



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD		
40.307	0	40.307	43.307	46.307		

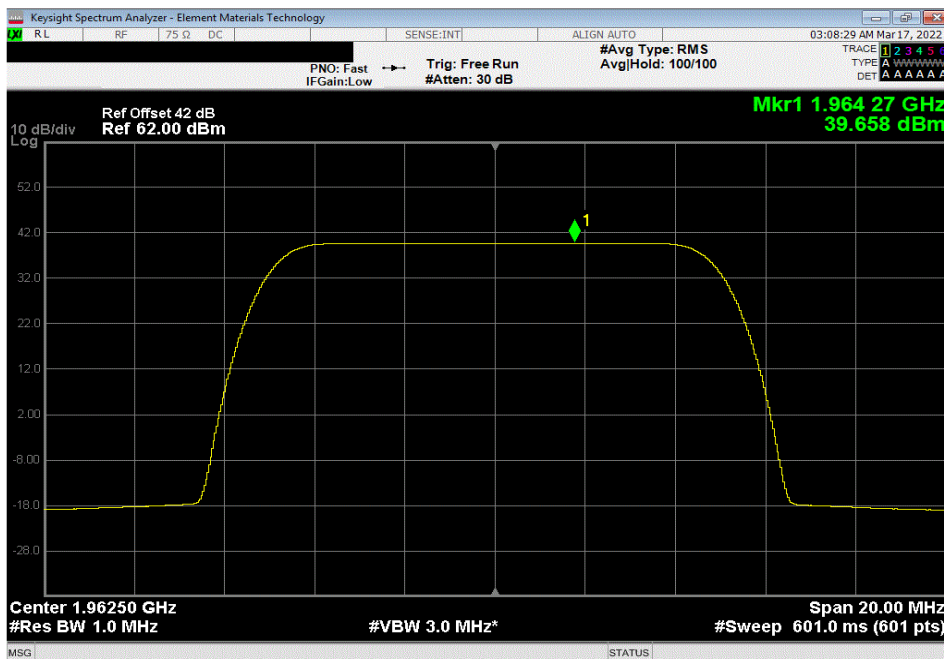


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

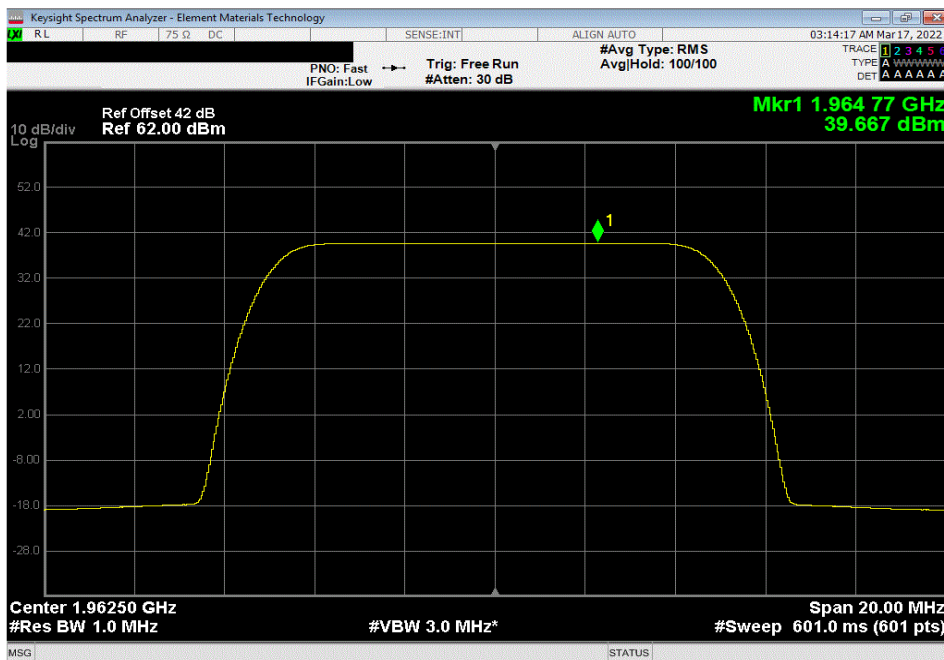


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	39.658	0	39.658	42.658	45.658	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	39.667	0	39.667	42.667	45.667	

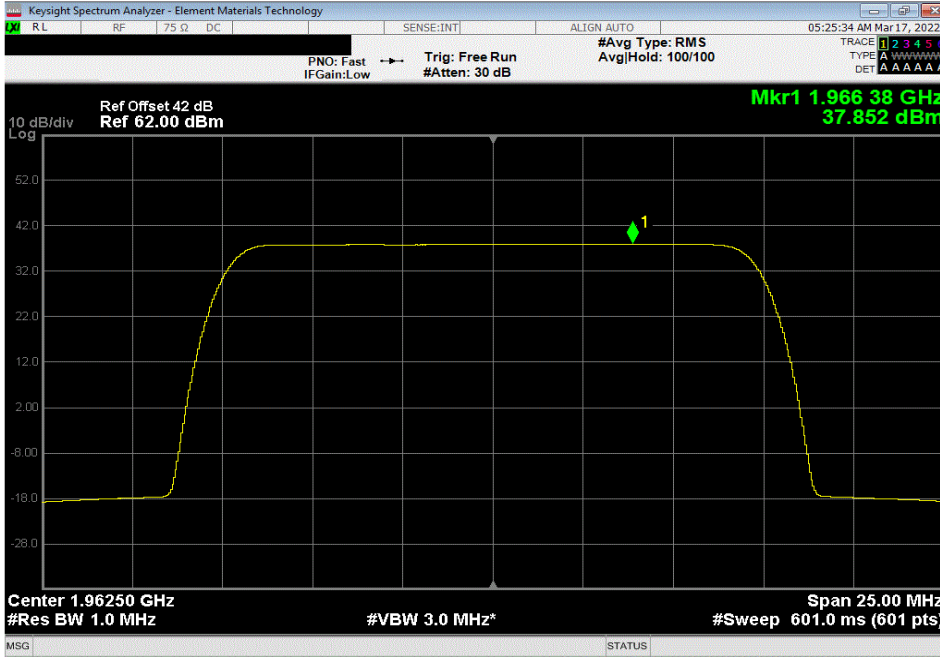


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

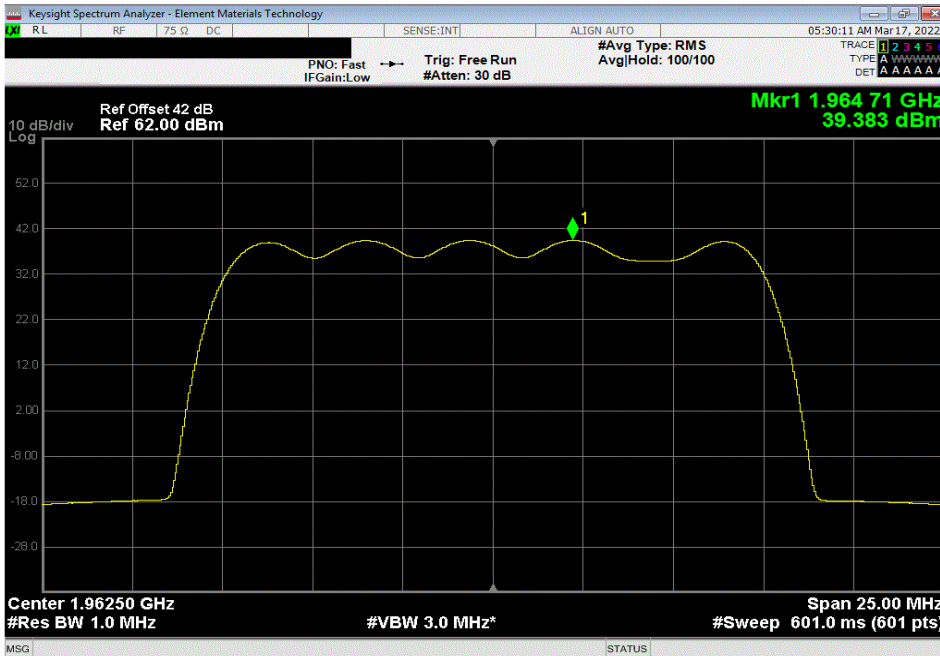


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 15 MHz Bandwidth, QPSK Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	37.852	0	37.852	40.852	43.852	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	39.383	0	39.383	42.383	45.383	

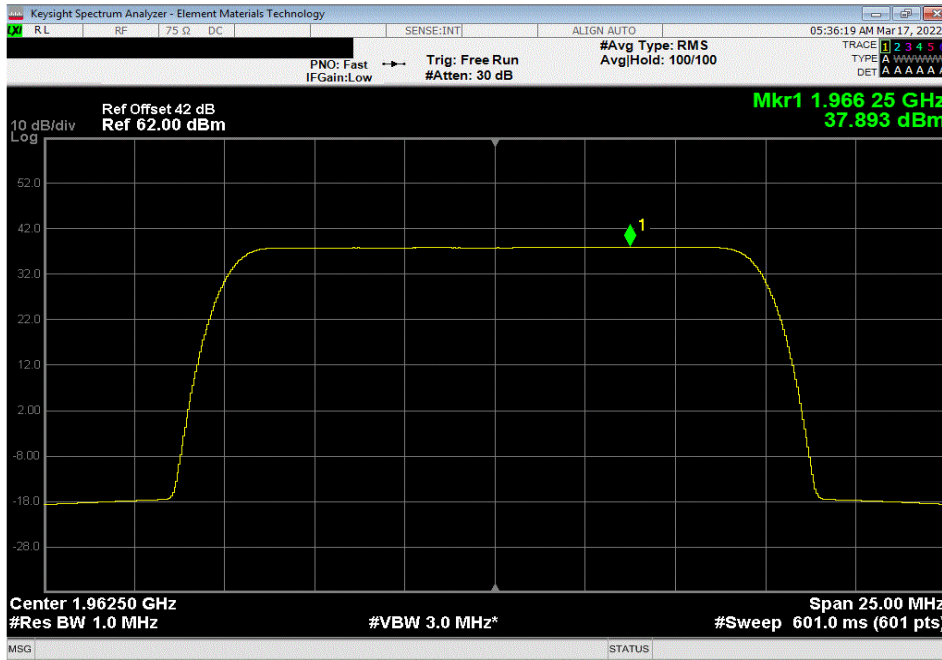


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

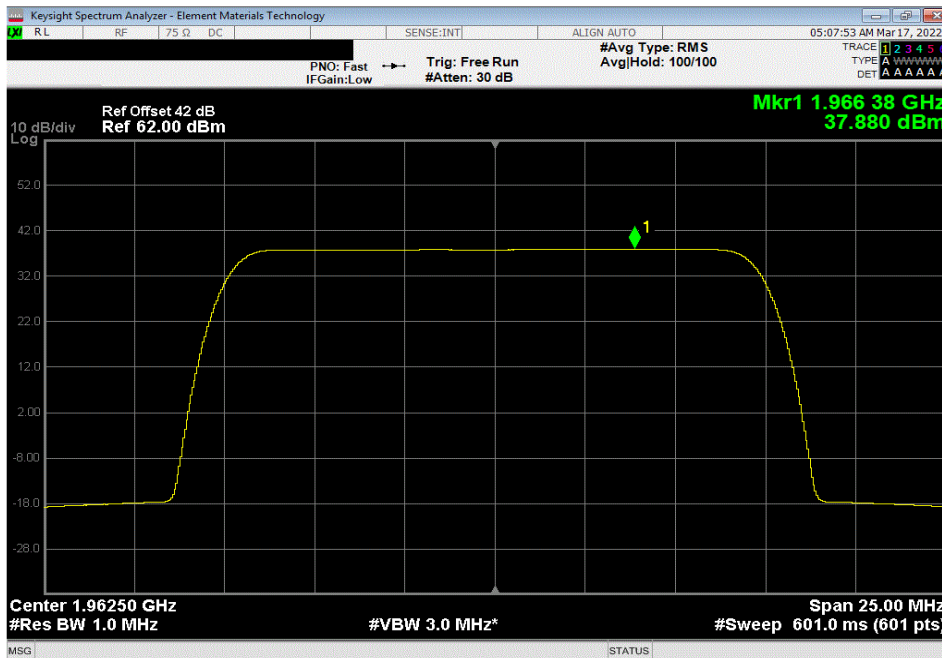


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	37.893	0	37.893	40.893	43.893	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	37.88	0	37.88	40.88	43.88	

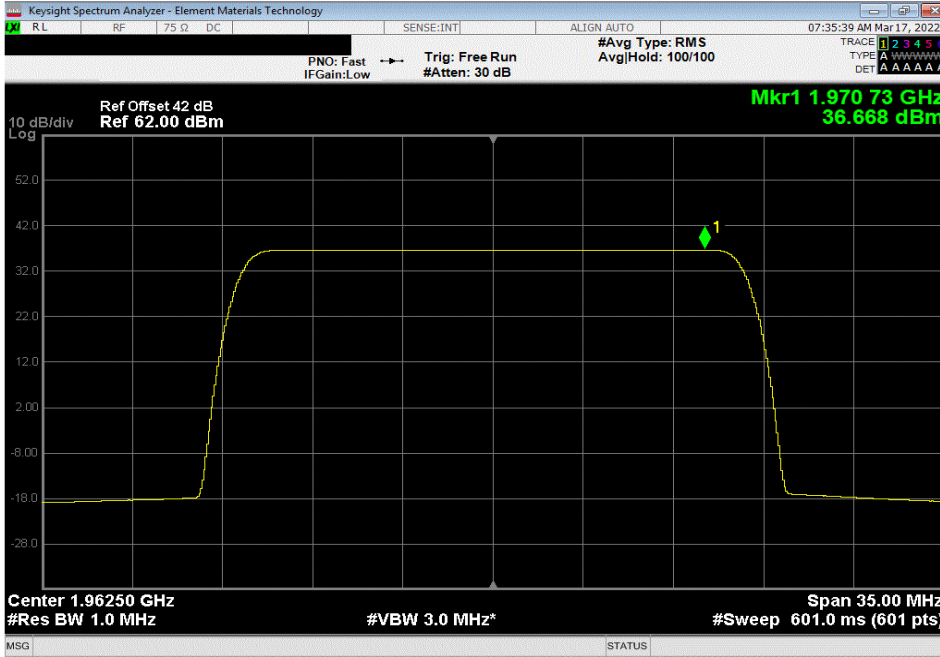


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

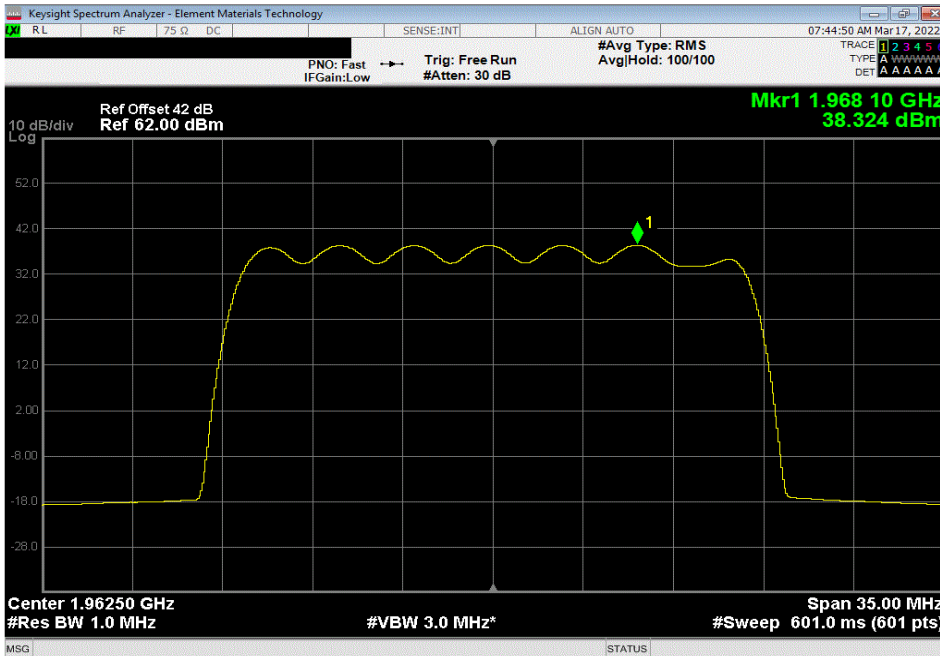


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 20 MHz Bandwidth, QPSK Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	36.668	0	36.668	39.668	42.668	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	38.324	0	38.324	41.324	44.324	

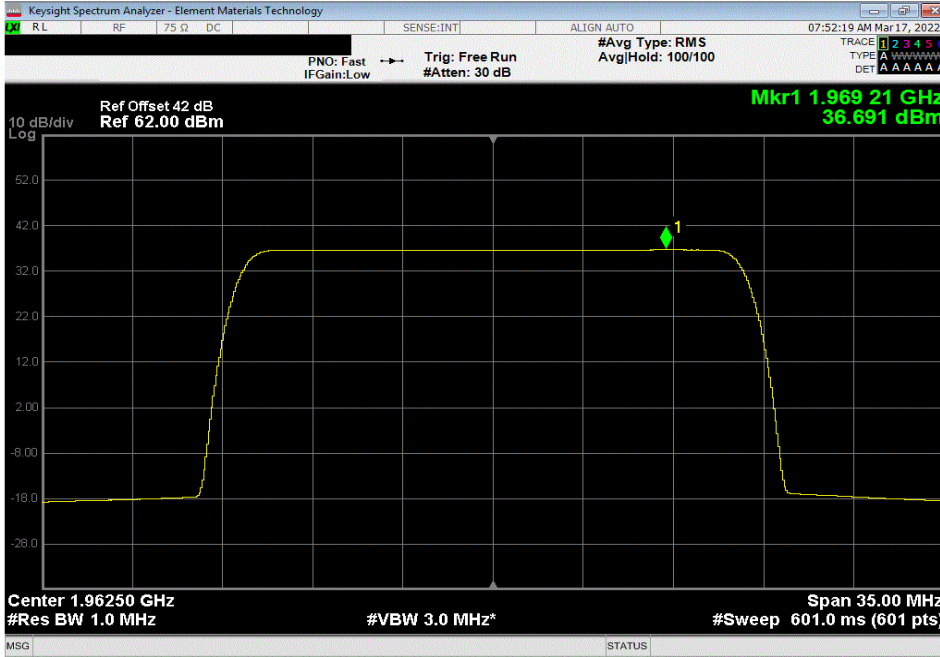


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

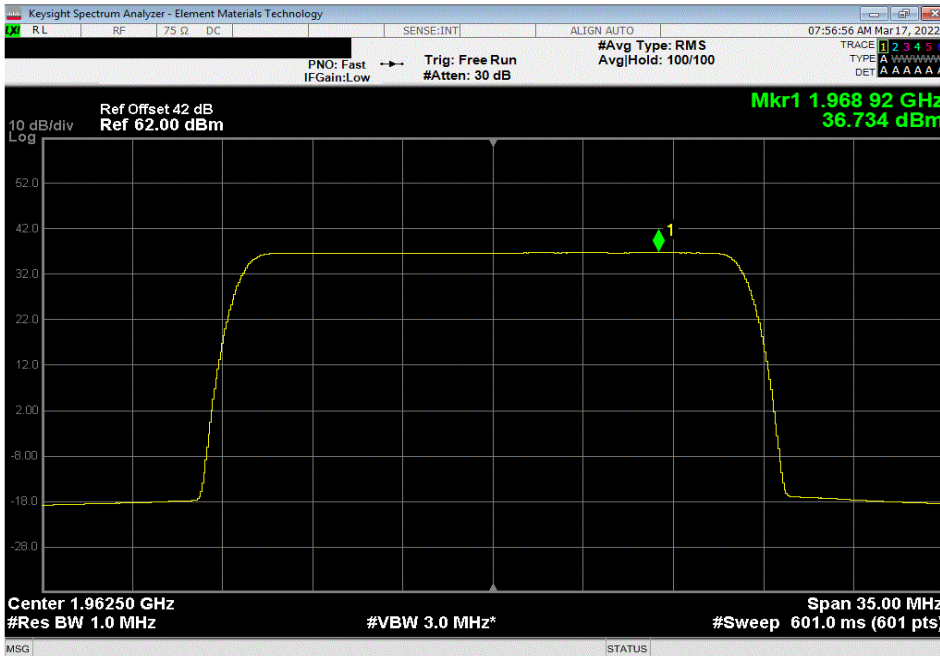


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	36.691	0	36.691	39.691	42.691	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	36.734	0	36.734	39.734	42.734	

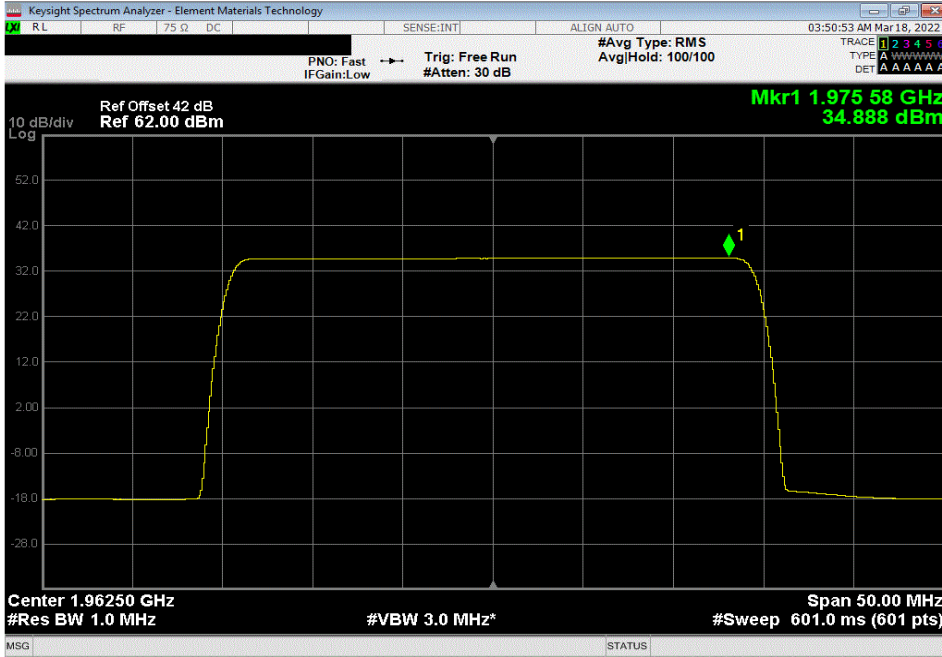


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

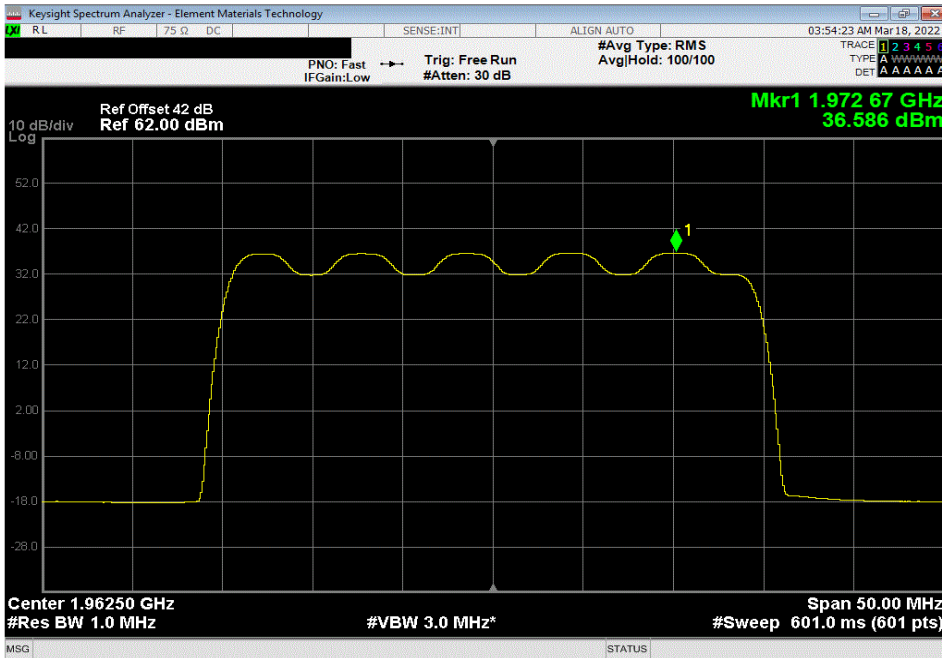


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 30 MHz Bandwidth, QPSK Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	34.888	0	34.888	37.888	40.888	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	36.586	0	36.586	39.586	42.586	

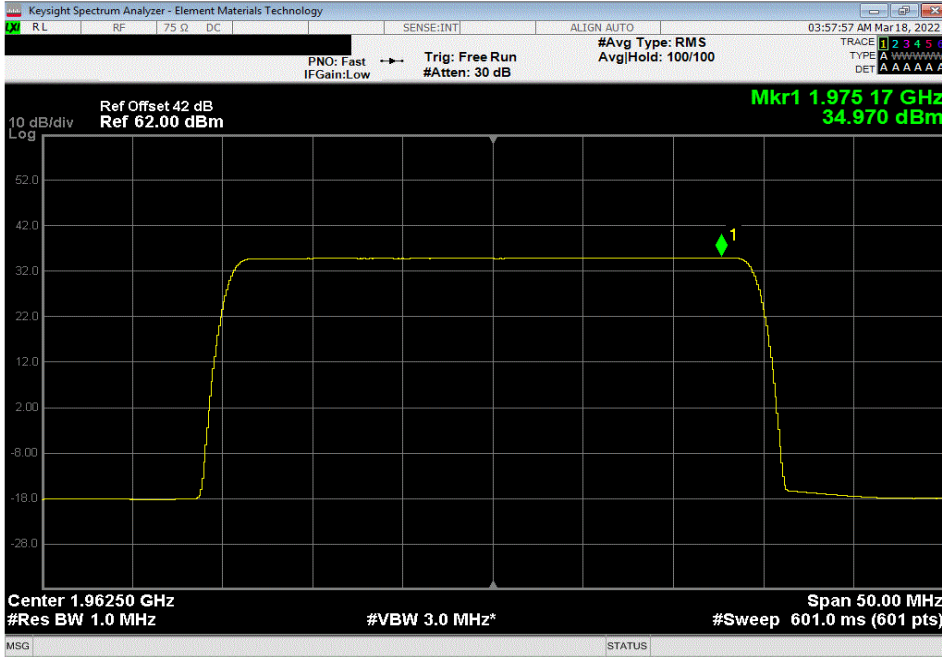


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

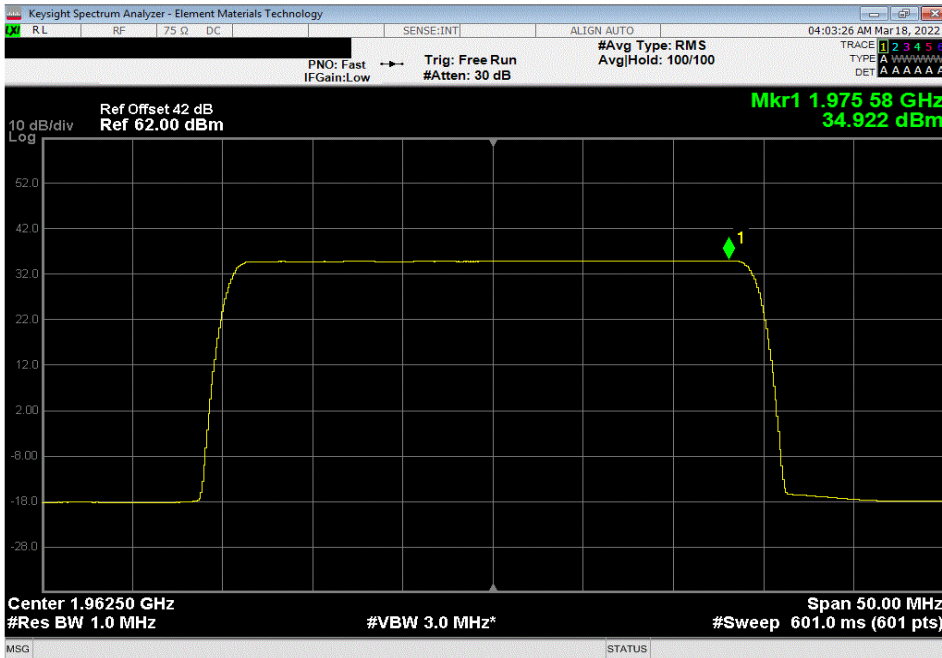


TbTn 2021.12.14.1 XMI 2022.02.07.0

Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	34.97	0	34.97	37.97	40.97	



Band n25, 1930 MHz - 1995 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
	34.922	0	34.922	37.922	40.922	



POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



Tel: 2021.12.14.1 XMit 2022.02.07.0

EIRP Calculations for Four Port MIMO Operations for Band n25 Single NR Carriers

EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements. Each cell site installation needs to consider the power measurements in the radio certification report as well as site specific regulatory requirements (such as antenna height, population density, etc.), site installation parameters (line loss between antenna and radio, antenna parameters, etc.) and base station operational parameters (MIMO operational setup, carrier power level, channel bandwidth, modulation type, etc.) to optimize performance. Transmitter output power may be reduced (from maximum) by base station setup parameters. Base station antennas are selected by the customer.

The base station antenna is selected by the customer and this EIRP calculation is based upon a sample worst case antenna. The EIRP calculation is based upon Kathrein antenna assembly model "80011867". The maximum Band n25 gain (17.9dBi) for this antenna was used for the EIRP calculation. This antenna assembly has a pair of +45° cross-polarized radiators used for Band n25. The four antenna RF inputs (used for Band n25) on the antenna assembly are as follows: Y1+ L5 (+45°), Y1- L6 (-45°), Y2+ R7 (+45°) and Y2- R8 (-45°). Four AHFII transmitter outputs are connected to the antenna assembly RF inputs.

Equivalent Isotropically Radiated Power (EIRP) is calculated (as specified in ANSI C63.26-2015 section 6.4 for a system of correlated output signals) from the results of power measurements (highest measured PSD for each channel bandwidth type). The maximum antenna gain was used for this calculation. The cable loss between the antenna and transmitter is site dependent (will not be 0 dB) but for this worst case EIRP calculation 0 dB was used. Calculations of worst-case EIRP for four port MIMO are as follows:

Parameter	5 MHz Ch BW	10 MHz Ch BW	15 MHz Ch BW	20 MHz Ch BW	30 MHz Ch BW
Worst Case PSD/Antenna Port	43 dBm/MHz	40.3 dBm/MHz	39.4 dBm/MHz	38.3 dBm/MHz	36.6 dBm/MHz
Cable Loss (site dependent)	0 dB	0 dB	0 dB	0 dB	0 dB
Maximum Antenna Gain (G _{ant})	17.9 dBi	17.9 dBi	17.9 dBi	17.9 dBi	17.9 dBi
Directional Gain = G _{ant} + 10Log (2) See Note 1	20.9 dBi	20.9 dBi	20.9 dBi	20.9 dBi	20.9 dBi
EIRP for Antenna Y1 +45° EIRP for Ant Y1 +45° ²ⁿ	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
PSD/ant port - Cable Loss + Dir Gain					
EIRP for Antenna Y1 -45°	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
EIRP subtotal for Y1 +45° and Y1 -45° (See Note 2)	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
EIRP for Antenna Y2 +45°	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
EIRP for Antenna Y2 -45°	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
EIRP subtotal for Y2 +45° and Y2 -45° (See Note 2)	63.9 dBm/MHz	61.3 dBm/MHz	60.3 dBm/MHz	59.2 dBm/MHz	57.5 dBm/MHz
EIRP Total = Y1 ±45° and Y2 ±45° (See Note 3)	66.9 dBm/MHz	64.3 dBm/MHz	63.3 dBm/MHz	62.2 dBm/MHz	60.5 dBm/MHz

Note 1: The directional gain was calculated for two antennas since there are a pair of cross-polarized radiators. See ANSI C63.26 sections 6.4.5.3.3a) & 6.4.5.3.1a), and KDB 662911D01v02r01 paragraphs F)2)c)(i) & F)2)a)(i) for guidance.

Note 2: The EIRP per antenna polarity is required to be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the two transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Note 3: Antenna Y1 and Y2 are correlated - the EIRPs are required to be summed and be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)3) and KDB 662911 D02v01 page example (3).

Calculation Summary

The worst case AHFII four port MIMO Band n25 EIRP levels using antenna assembly model "80011867" are:

- (1) Less than the FCC and ISED (3280 W/MHz or 65.16 dBm/MHz) EIRP Regulatory Limits for 10, 15, 20 & 30MHz channel bandwidths.
- (2) Over the FCC/ISED (3280 W/MHz or 65.16 dBm/MHz) EIRP Regulatory Limits by 1.74 dB (66.9dBm/MHz - 65.16dBm/MHz) for the 5MHz channel bandwidth. EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements as noted above.
- (3) Less than the FCC and ISED (1640 W/MHz or 62.15 dBm/MHz) EIRP Regulatory Limits for 30MHz channel bandwidths.
- (4) Over the FCC/ISED (1640 W/MHz or 62.15 dBm/MHz) EIRP Regulatory Limits by 4.75 dB (66.9dBm/MHz - 62.15dBm/MHz) for the 5MHz channel bandwidth, by 2.15 dB (64.3dBm/MHz - 62.15dBm/MHz) for the 10MHz channel bandwidth, by 1.15 dB (63.3dBm/MHz - 62.15dBm/MHz) for the 15MHz channel bandwidth and by 0.05 dB (62.2dBm/MHz - 62.15dBm/MHz) for the 20MHz channel bandwidth. EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements as noted above.
- (5) See "Output Power - Lowered Power" and the Power Spectral Density - Lowered Power" sections of this report for details of compliance verification by changing BTS configuration file power output parameters.

POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



TstTx_2022.03.14.0 XMI_2022.02.07.0

EUT: AHFII Remote Radio Head		Work Order: NOKI0038	
Serial Number: YK214000035		Date: 19-Mar-22	
Customer: Nokia of America Corporation		Temperature: 22.3 °C	
Attendees: Mitchell Hill		Humidity: 42.8% RH	
Project: None		Barometric Pres.: 1019 mbar	
Tested by: Brandon Hobbs		Job Site: TX09	
Power: 54 VDC			
TEST SPECIFICATIONS		Test Method	
FCC 27:2022		ANSI C63.26:2015	
RSS-139 Issue 3:2015, RSS-170 Issue 3:2015		RSS-139 Issue 3:2015, RSS-170 Issue 3:2015	
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 at maximum power (80 watts/carrier).The PSD was measured while transmitting one carrier on Port 1. The total PSD for multiport (2x2 MIMO and 4x4 MIMO) operation was determined based upon ANSI 63.26 clause 6.4.3.2.4 (10 Log Nout). The total PSD for two port operation is single port PSD +3dB [i.e. 10 Log(2)]. The total PSD for four port operation is single port PSD +6dB [i.e. 10 Log(4)].			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature	
		Initial Value dBm/MHz	Duty Cycle Factor (dB)
		Single Port dBm/MHz == PSD	Two Port (2x2 MIMO) dBm/MHz == PSD
		Four Port (4x4 MIMO) dBm/MHz == PSD	

Band n66, 2110 MHz - 2200 MHz, 5G NR

Port 1

5 MHz Bandwidth

QPSK Modulation

Low Channel, 2112.5 MHz	42.787	0	42.8	45.8	48.8
Mid Channel, 2155 MHz	42.618	0	42.6	45.6	48.6
High Channel, 2197.5 MHz	42.690	0	42.7	45.7	48.7

16-QAM Modulation

Low Channel, 2112.5 MHz	42.714	0	42.7	45.7	48.7
Mid Channel, 2155 MHz	42.507	0	42.5	45.5	48.5
High Channel, 2197.5 MHz	42.615	0	42.6	45.6	48.6

64-QAM Modulation

Low Channel, 2112.5 MHz	42.770	0	42.8	45.8	48.8
Mid Channel, 2155 MHz	42.517	0	42.5	45.5	48.5
High Channel, 2197.5 MHz	42.631	0	42.6	45.6	48.6

256-QAM Modulation

Low Channel, 2112.5 MHz	42.744	0	42.7	45.7	48.7
Mid Channel, 2155 MHz	42.503	0	42.5	45.5	48.5
High Channel, 2197.5 MHz	42.614	0	42.6	45.6	48.6

10 MHz Bandwidth

QPSK Modulation

Mid Channel, 2155 MHz	39.254	0	39.3	42.3	45.3
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16-QAM Modulation

Mid Channel, 2155 MHz	39.931	0	39.9	42.9	45.9
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64-QAM Modulation

Mid Channel, 2155 MHz	39.255	0	39.3	42.3	45.3
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256-QAM Modulation

Mid Channel, 2155 MHz	39.266	0	39.3	42.3	45.3
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15 MHz Bandwidth

QPSK Modulation

Mid Channel, 2155 MHz	37.551	0	37.6	40.6	43.6
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16-QAM Modulation

Mid Channel, 2155 MHz	39.036	0	39.0	42.0	45.0
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64-QAM Modulation

Mid Channel, 2155 MHz	37.590	0	37.6	40.6	43.6
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256-QAM Modulation

Mid Channel, 2155 MHz	37.566	0	37.6	40.6	43.6
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20 MHz Bandwidth

QPSK Modulation

Mid Channel, 2155 MHz	36.401	0	36.4	39.4	42.4
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16-QAM Modulation

Mid Channel, 2155 MHz	37.940	0	37.9	40.9	43.9
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64-QAM Modulation

Mid Channel, 2155 MHz	36.360	0	36.4	39.4	42.4
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256-QAM Modulation

Mid Channel, 2155 MHz	36.329	0	36.3	39.3	42.3
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30 MHz Bandwidth

QPSK Modulation

Mid Channel, 2155 MHz	34.589	0	34.6	37.6	40.6
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16-QAM Modulation

Mid Channel, 2155 MHz	36.325	0	36.3	39.3	42.3
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64-QAM Modulation

Mid Channel, 2155 MHz	34.652	0	34.7	37.7	40.7
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256-QAM Modulation

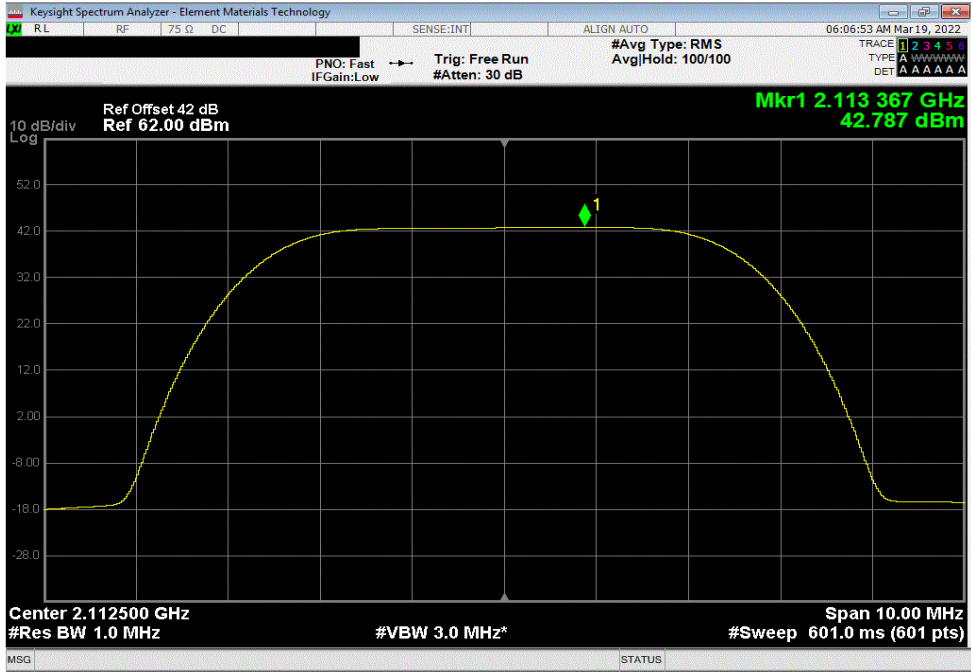
Mid Channel, 2155 MHz	34.629	0	34.6	37.6	40.6
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POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

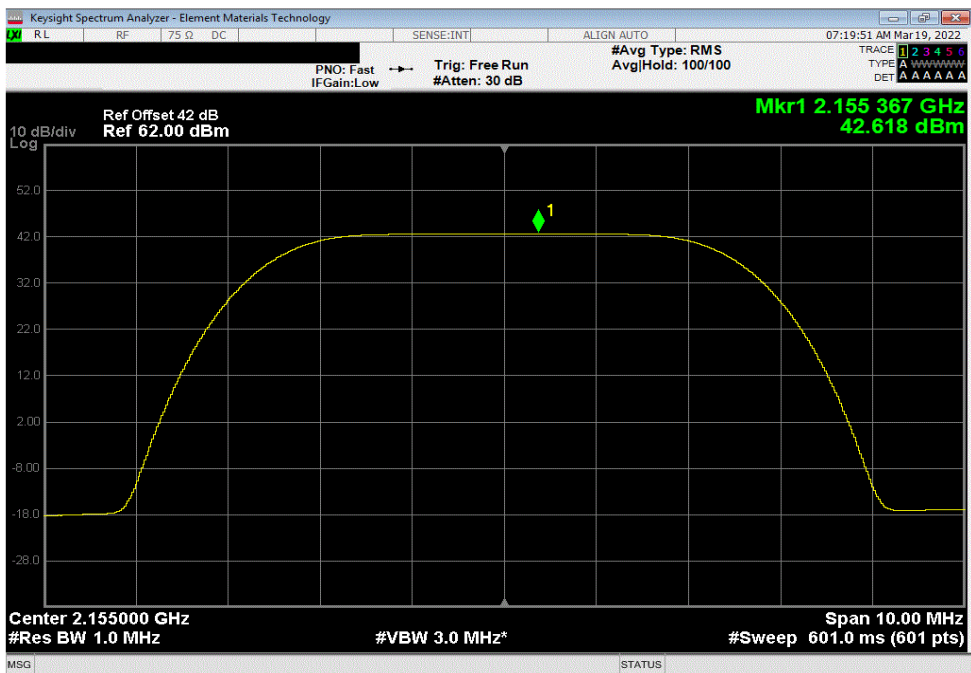


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 2112.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.787	0	42.787	45.787	48.787	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.618	0	42.618	45.618	48.618	

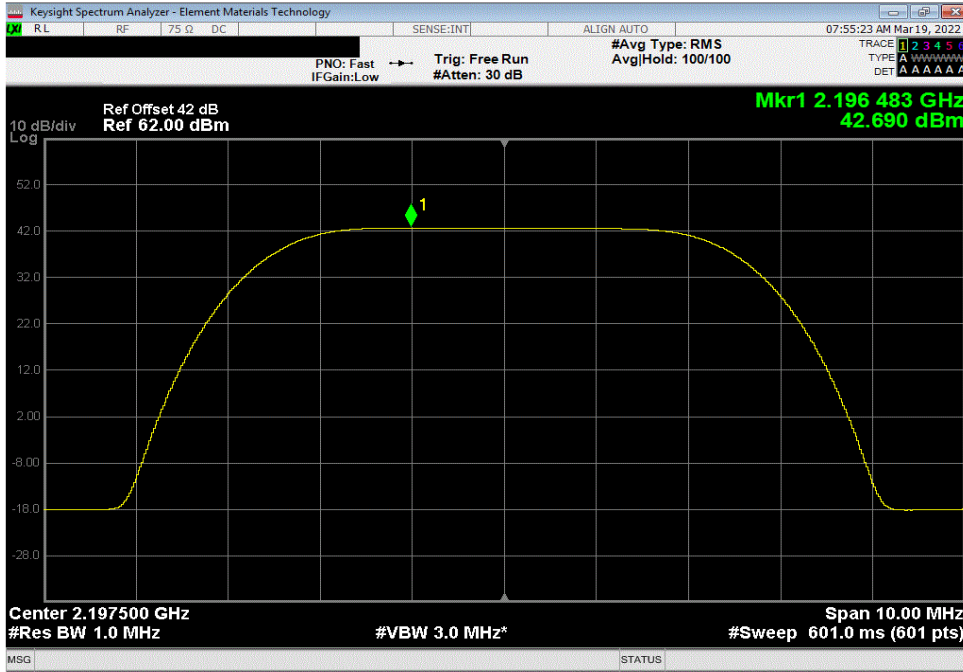


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

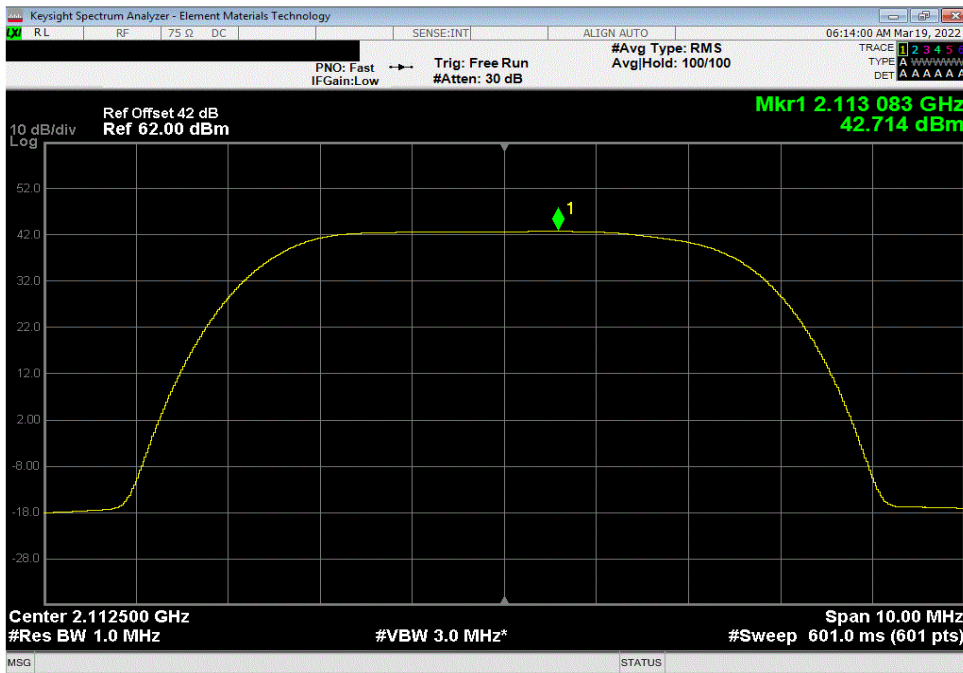


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, QPSK Modulation, High Channel, 2197.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.69	0	42.69	45.69	48.69	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, Low Channel, 2112.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.714	0	42.714	45.714	48.714	

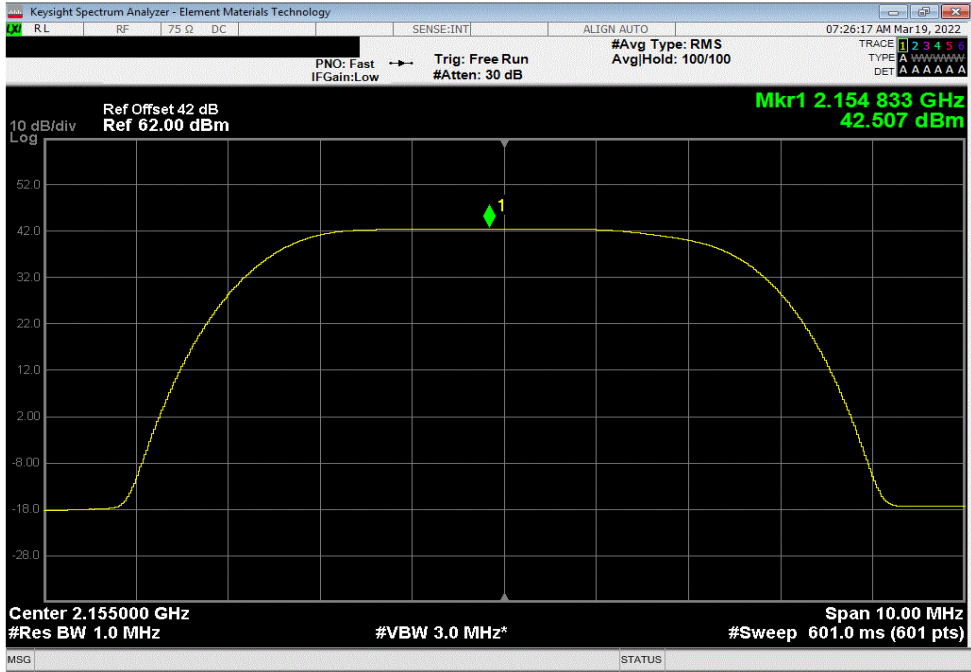


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

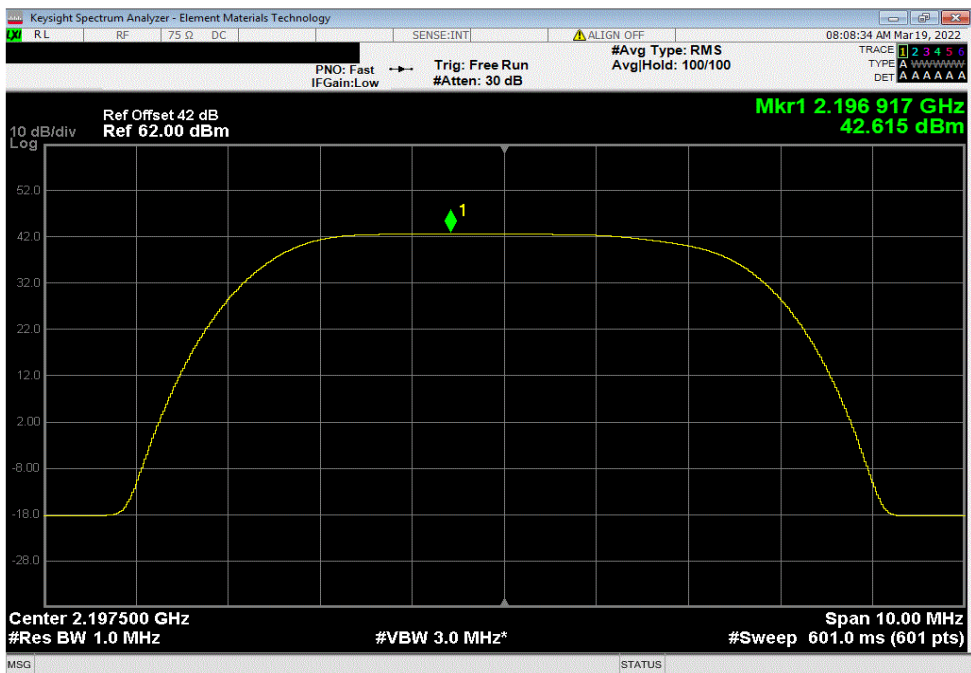


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.507	0	42.507	45.507	48.507	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 16-QAM Modulation, High Channel, 2197.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.615	0	42.615	45.615	48.615	

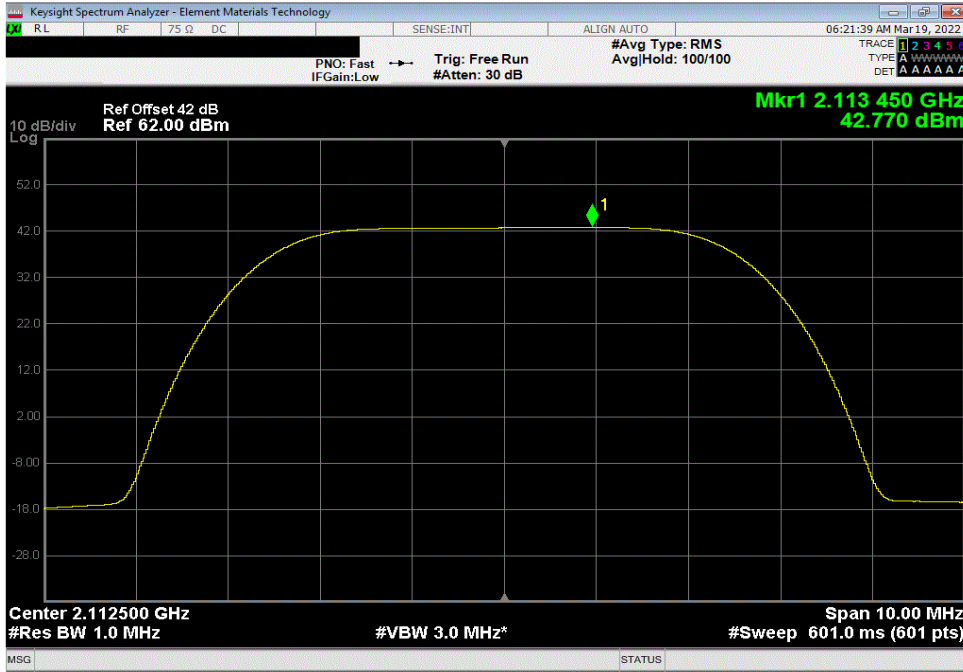


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

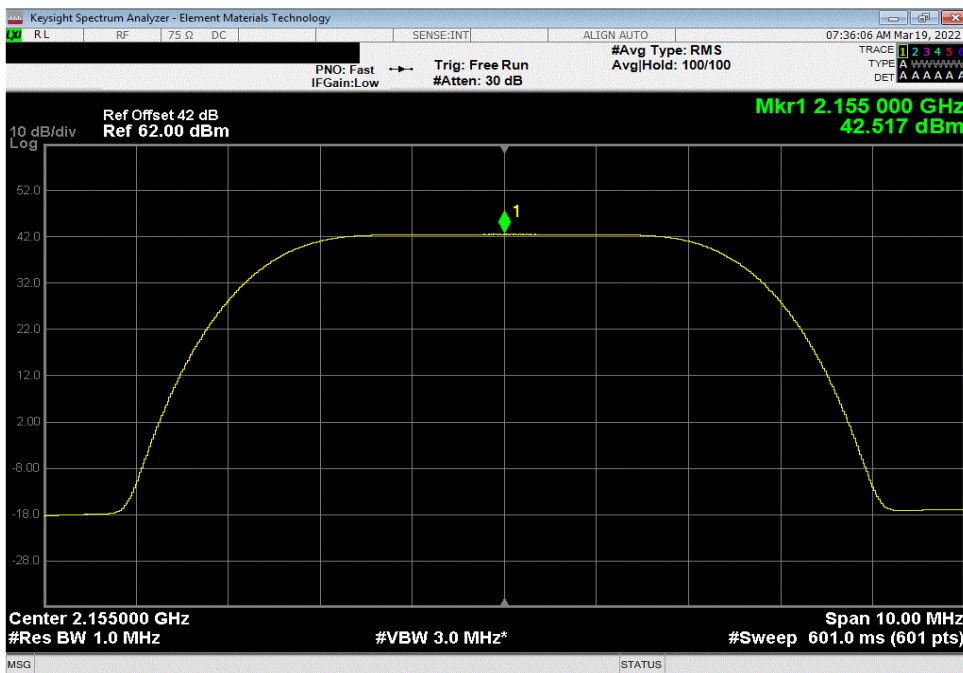


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, Low Channel, 2112.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.77	0	42.77	45.77	48.77	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.517	0	42.517	45.517	48.517	

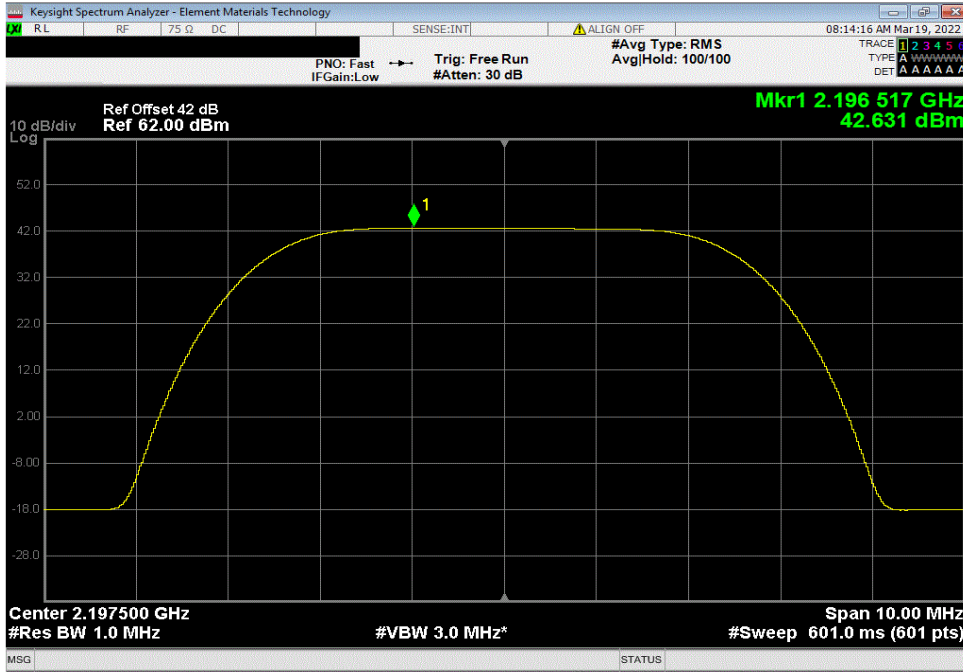


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

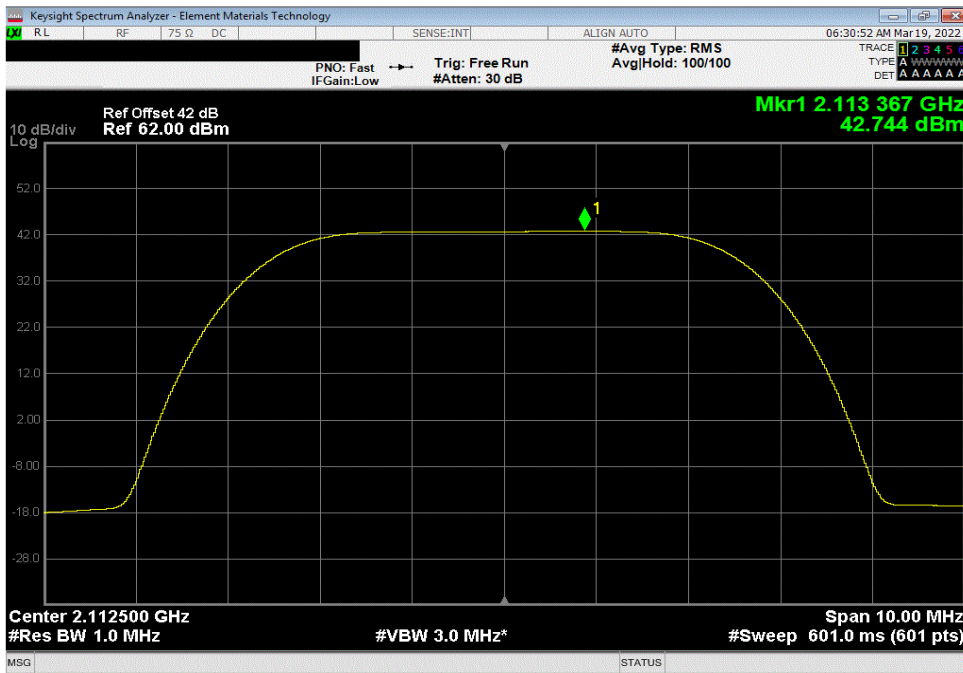


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 64-QAM Modulation, High Channel, 2197.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.631	0	42.631	45.631	48.631	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Low Channel, 2112.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.744	0	42.744	45.744	48.744	

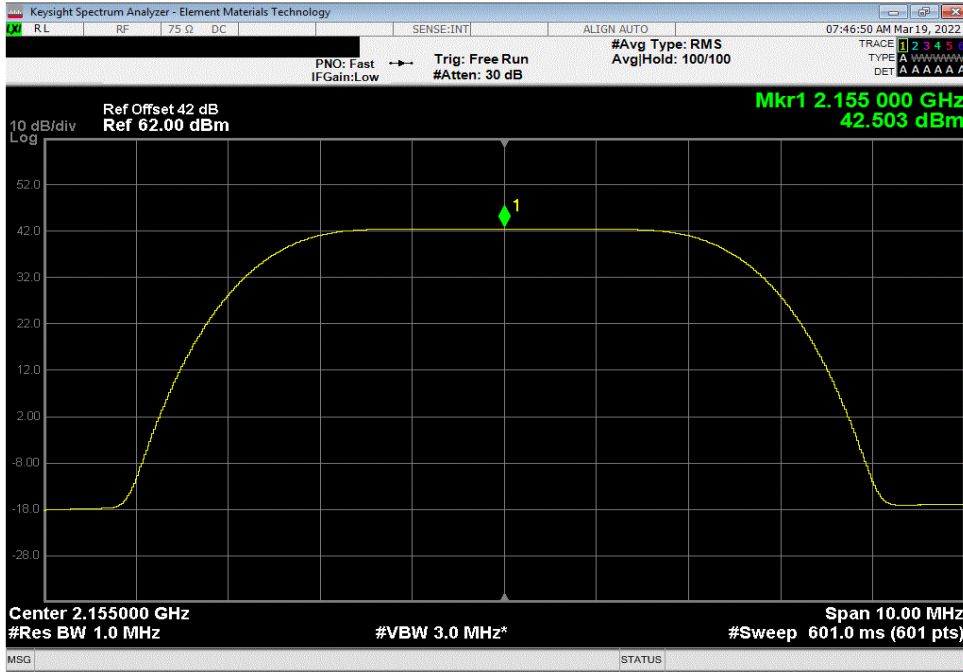


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

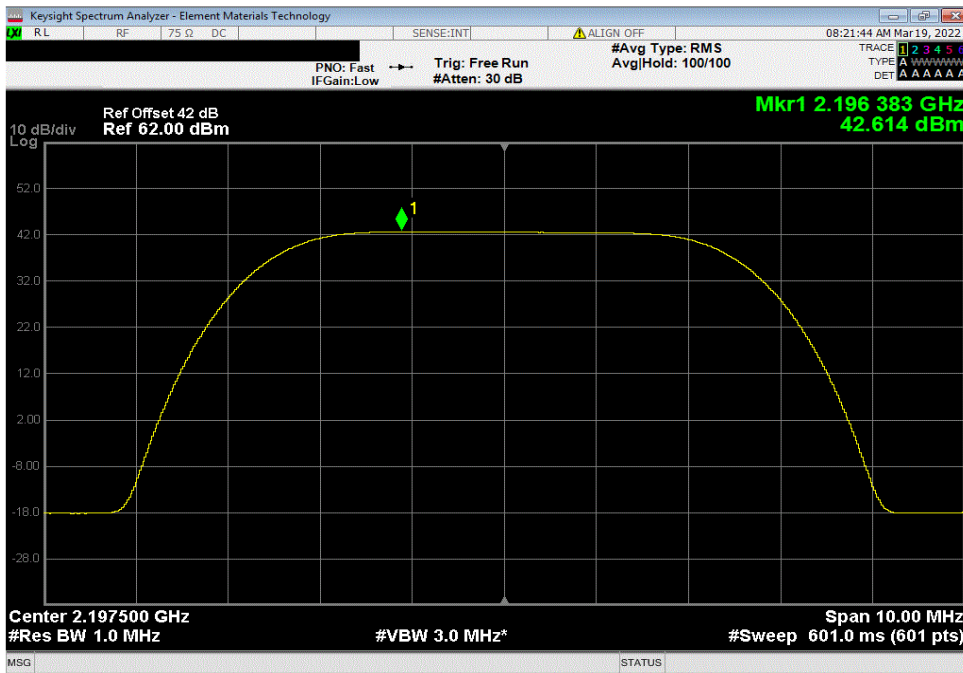


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.503	0	42.503	45.503	48.503	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 5 MHz Bandwidth, 256-QAM Modulation, High Channel, 2197.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
42.614	0	42.614	45.614	48.614	

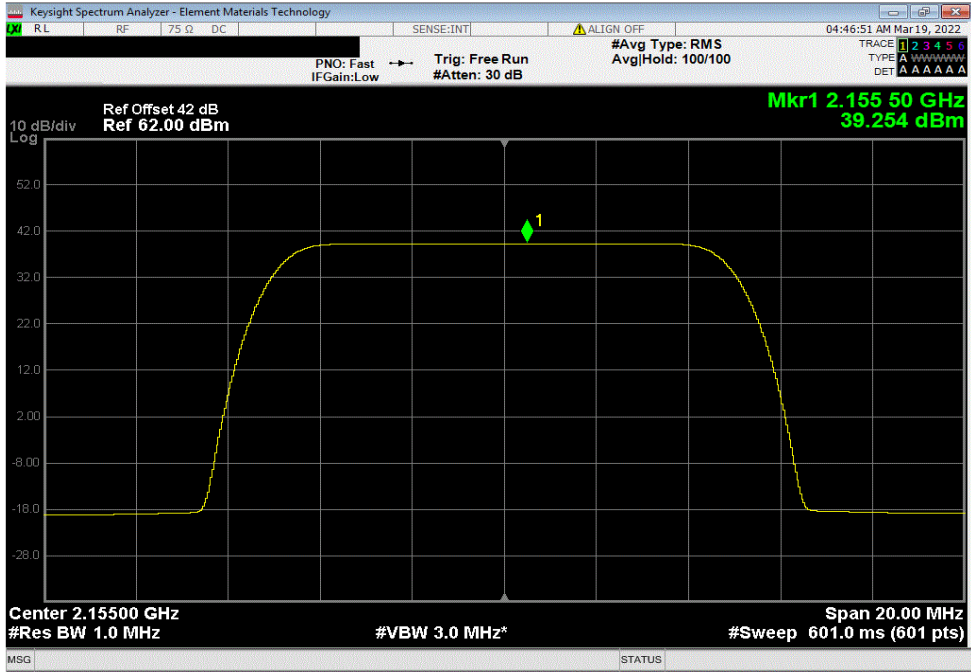


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

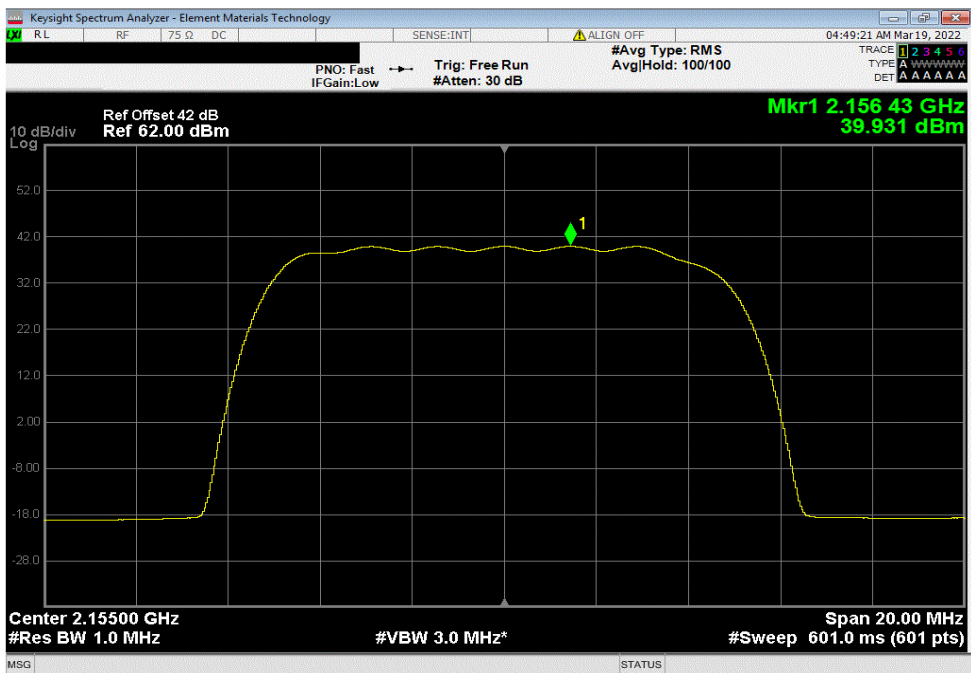


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
39.254	0	39.254	42.254	45.254	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
39.931	0	39.931	42.931	45.931	



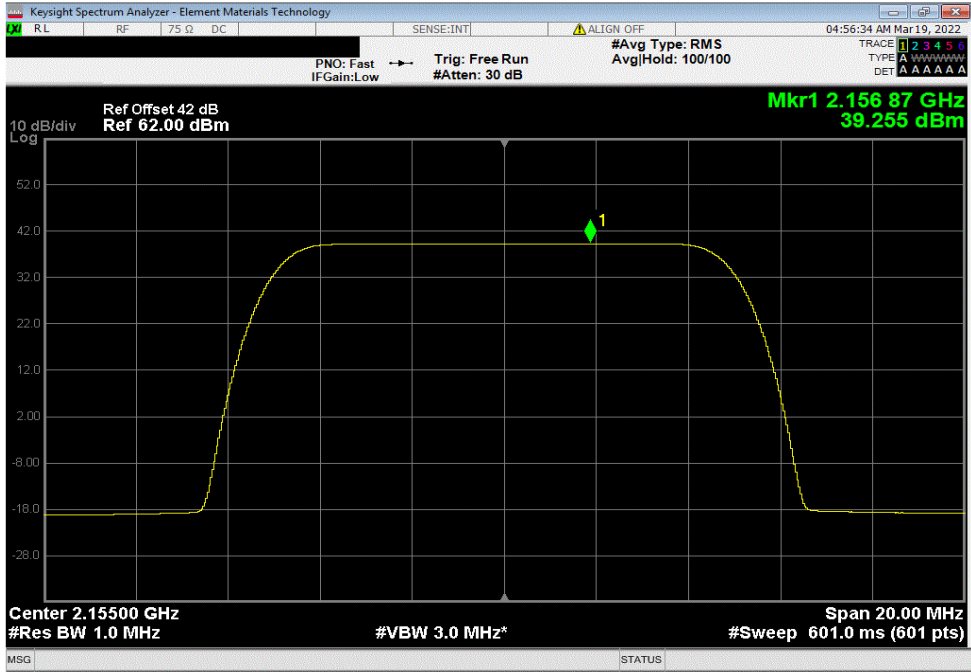
POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



TbTx 2022.03.14.0 XMI 2022.02.07.0

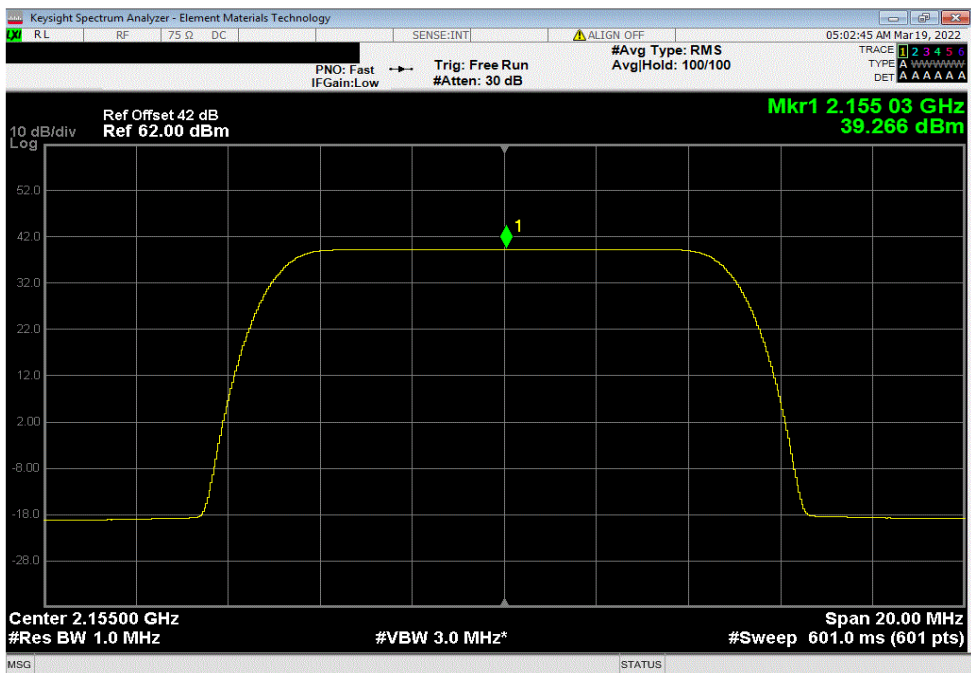
Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2155 MHz

Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/MHz == PSD	Two Port (2x2 MIMO) dBm/MHz == PSD	Four Port (4x4 MIMO) dBm/MHz == PSD
39.255	0	39.255	42.255	45.255



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz

Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/MHz == PSD	Two Port (2x2 MIMO) dBm/MHz == PSD	Four Port (4x4 MIMO) dBm/MHz == PSD
39.266	0	39.266	42.266	45.266

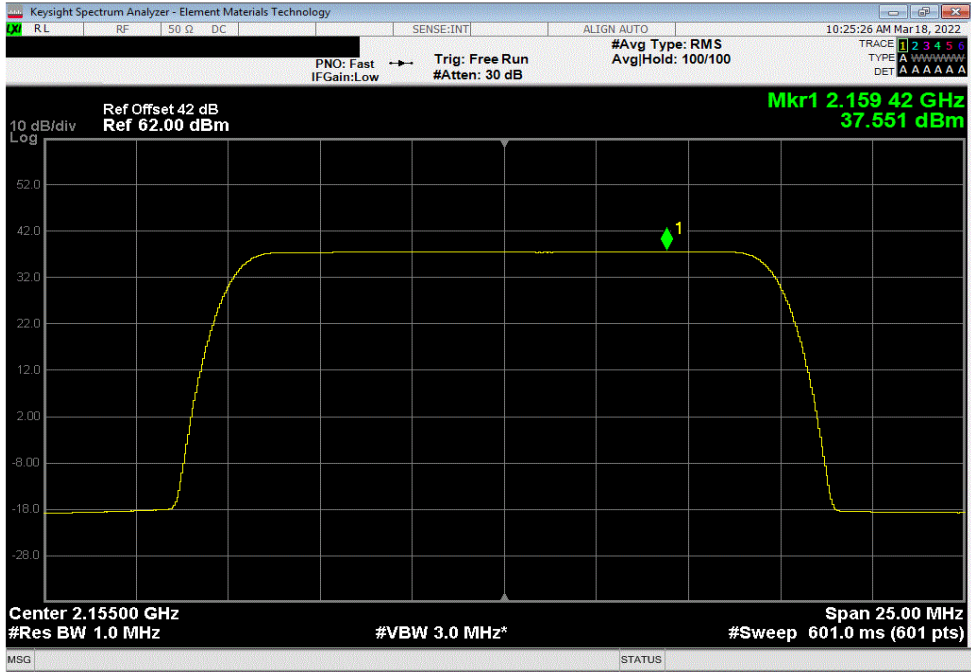


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

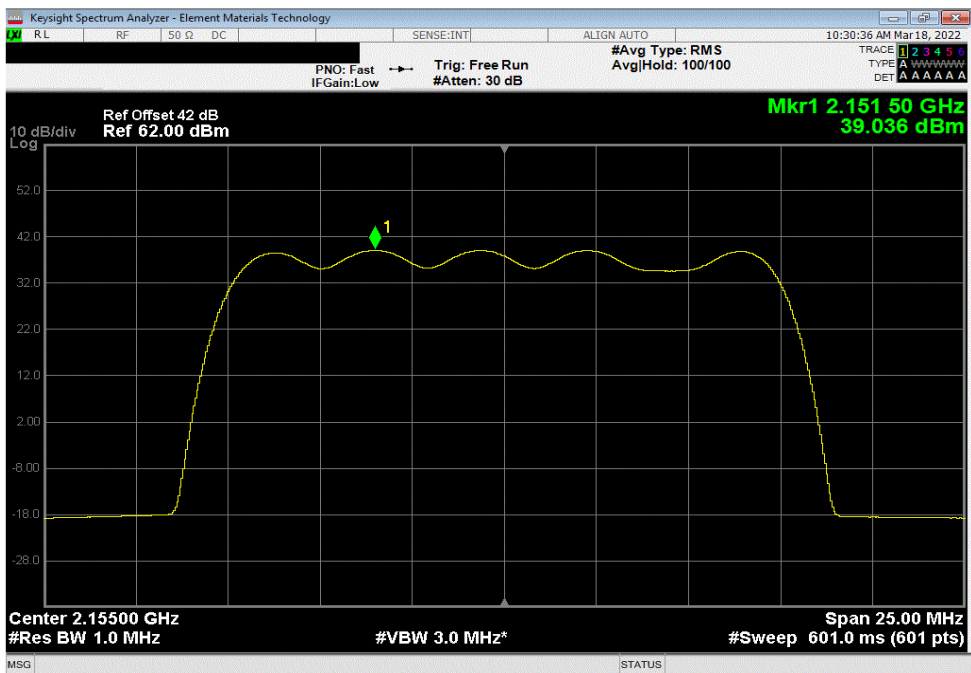


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 15 MHz Bandwidth, QPSK Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
37.551	0	37.551	40.551	43.551	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
39.036	0	39.036	42.036	45.036	

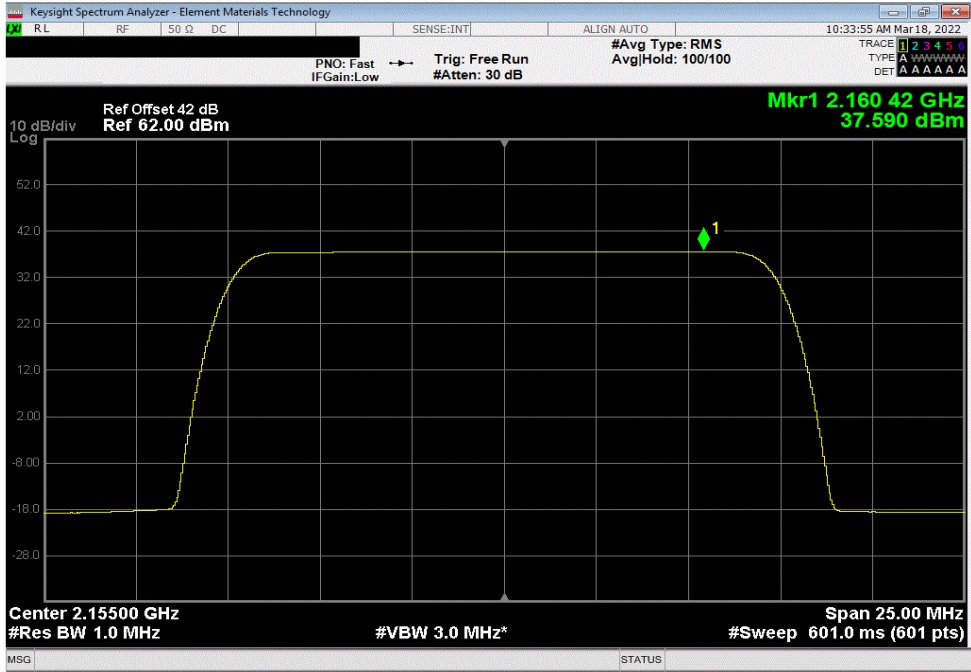


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

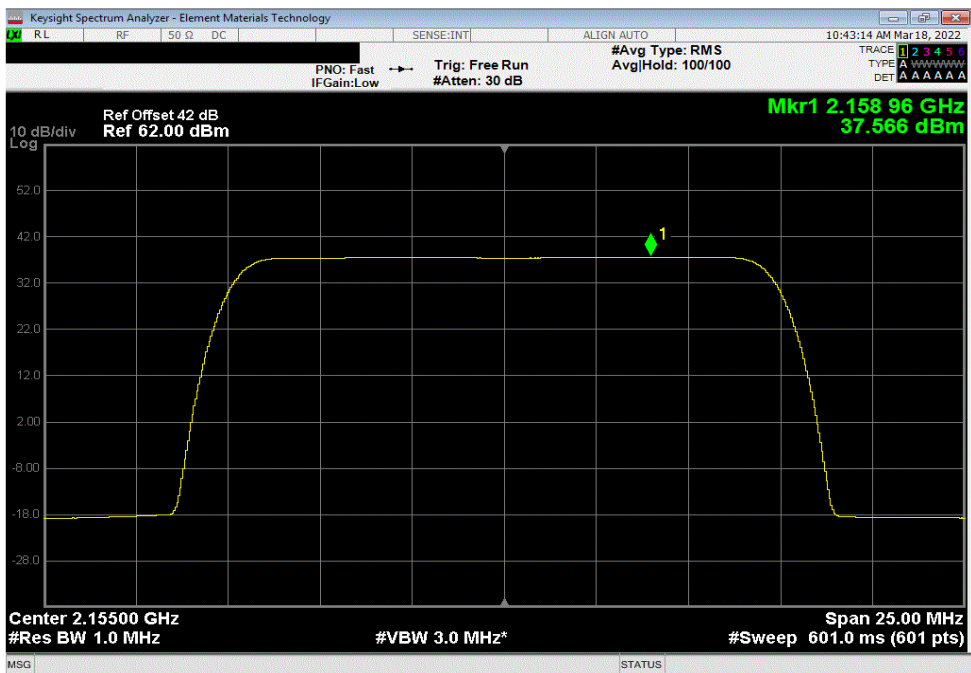


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
37.59	0	37.59	40.59	43.59	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
37.566	0	37.566	40.566	43.566	

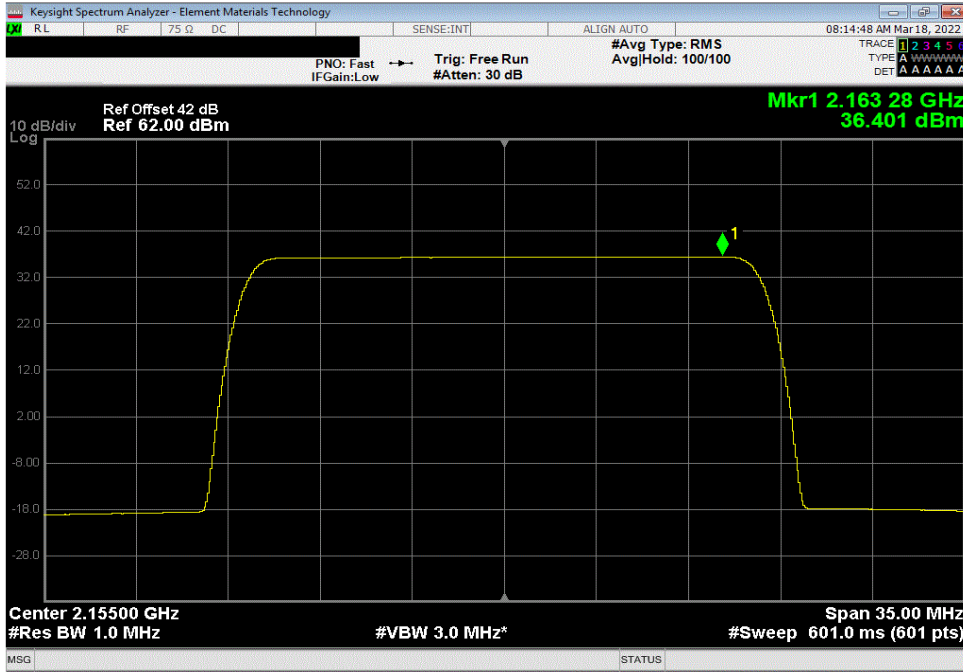


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

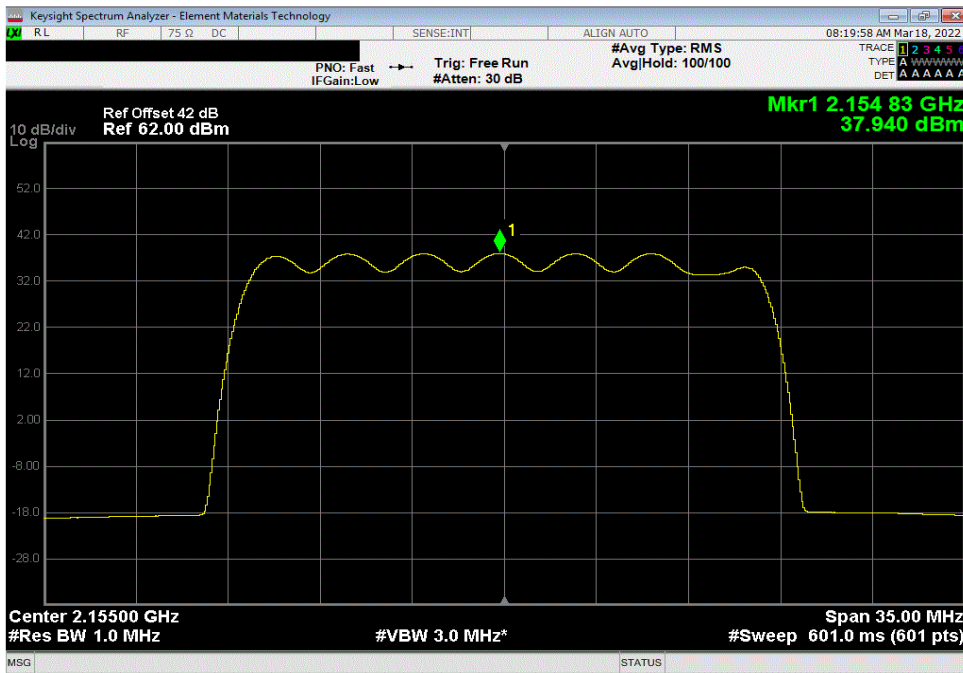


TbTx 2022.03.14.0 XMi 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 20 MHz Bandwidth, QPSK Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
36.401	0	36.401	39.401	42.401	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
37.94	0	37.94	40.94	43.94	

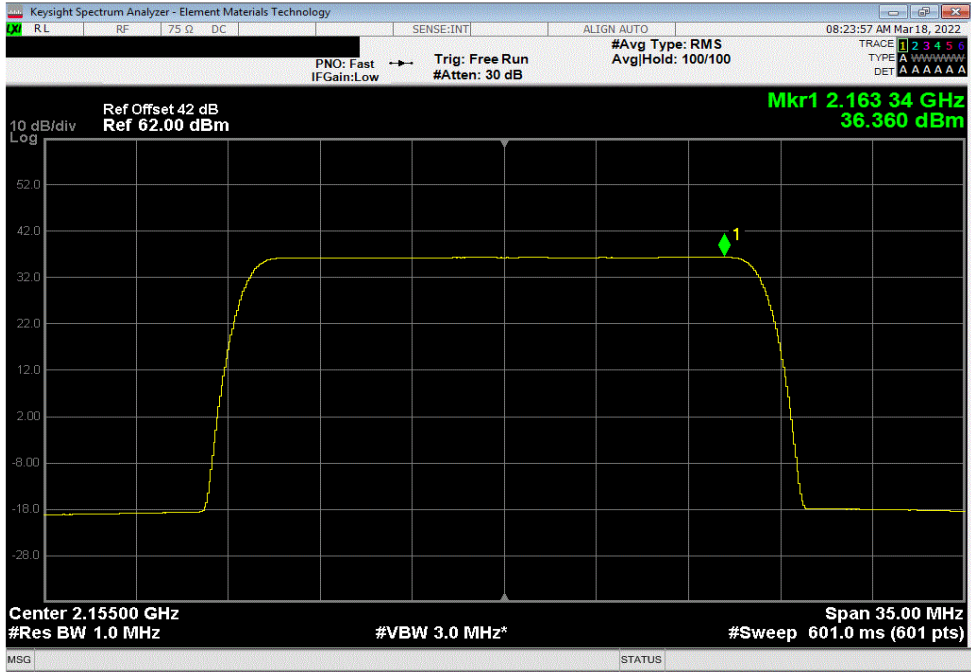


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

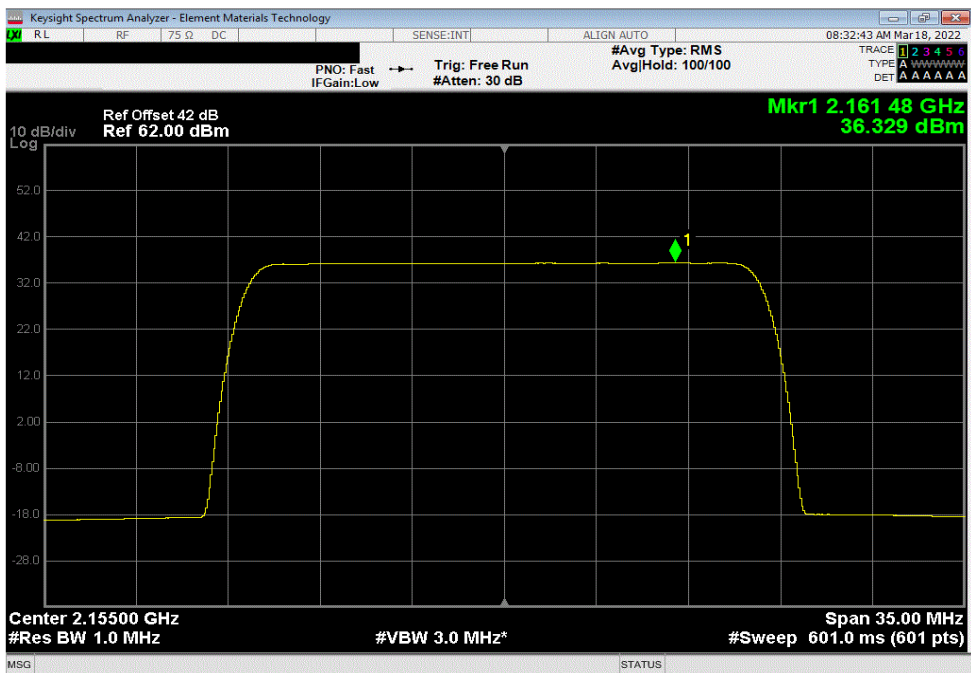


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
36.36	0	36.36	39.36	42.36	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
36.329	0	36.329	39.329	42.329	

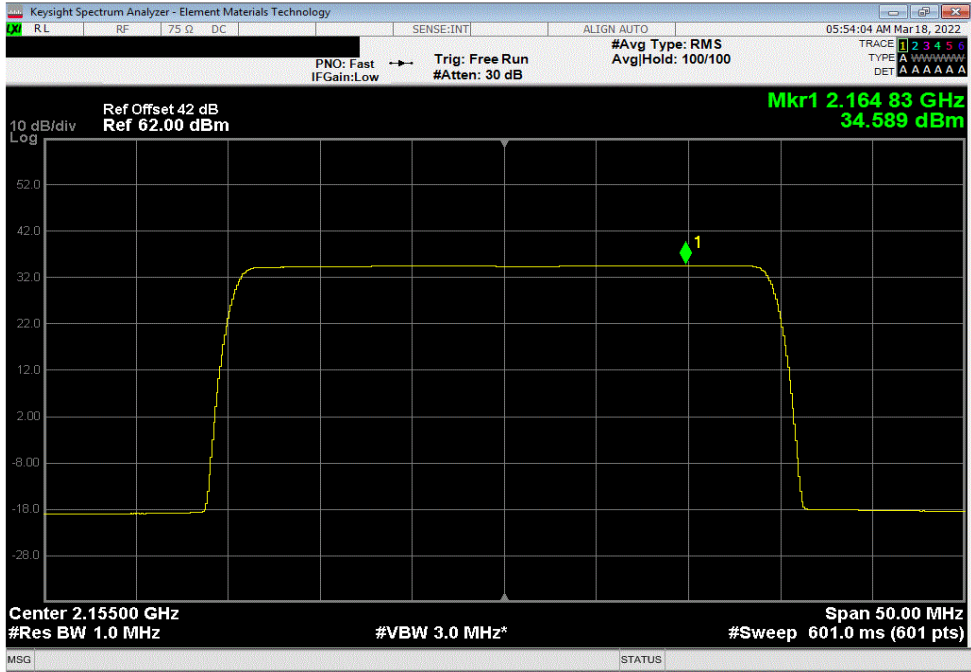


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

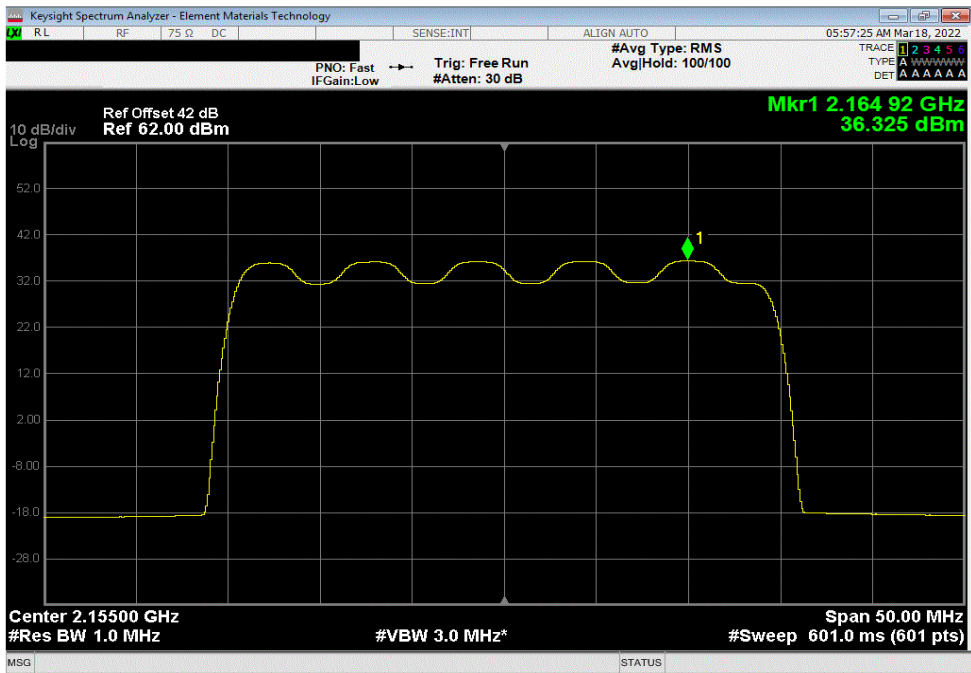


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 30 MHz Bandwidth, QPSK Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
34.589	0	34.589	37.589	40.589	



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2155 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD	
36.325	0	36.325	39.325	42.325	

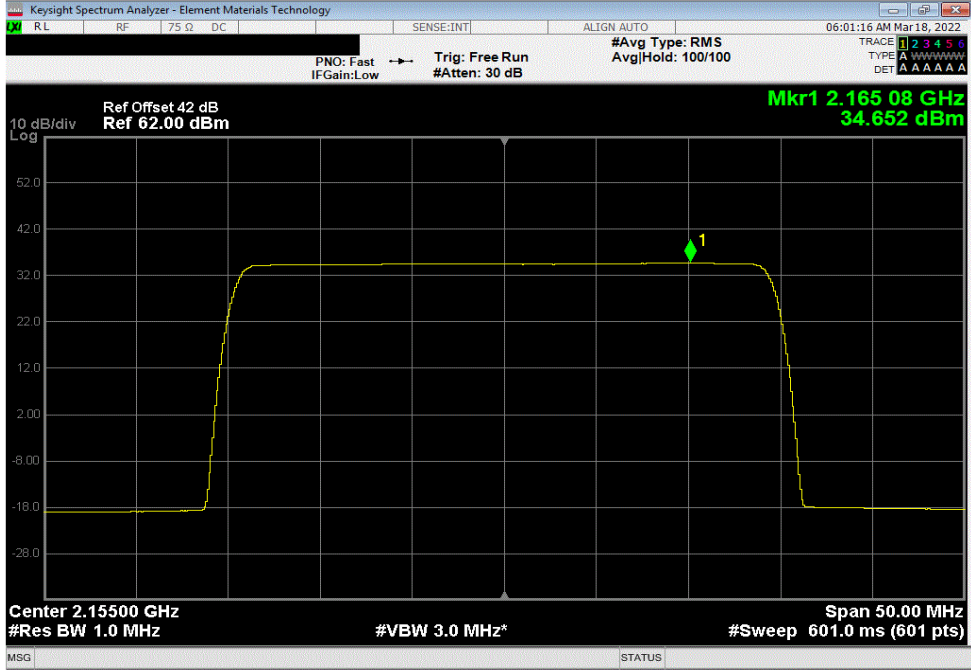


POWER SPECTRAL DENSITY AND EIRP CALCULATIONS

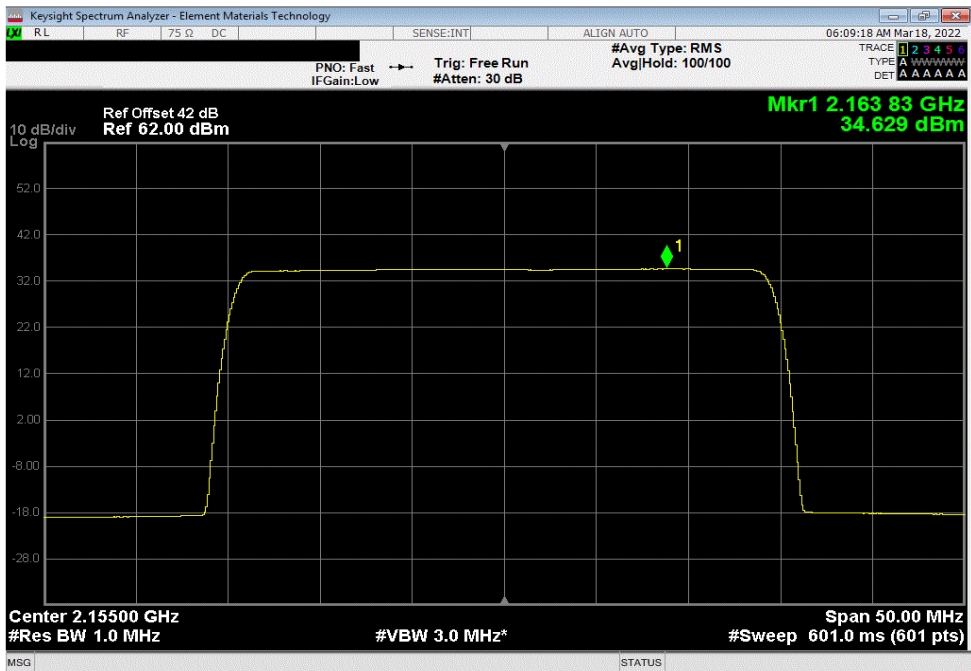


TbTx 2022.03.14.0 XMI 2022.02.07.0

Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD		
34.652	0	34.652	37.652	40.652		



Band n66, 2110 MHz - 2200 MHz, 5G NR, Port 1, 30 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2155 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/MHz == PSD	dBm/MHz == PSD	dBm/MHz == PSD		
34.629	0	34.629	37.629	40.629		



POWER SPECTRAL DENSITY AND EIRP CALCULATIONS



TbTt 2022.03.14.0 XMi 2022.02.07.0

EIRP Calculations for Four Port MIMO Operations for Band n66 Single NR Carriers

EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements. Each cell site installation needs to consider the power measurements in the radio certification report as well as site specific regulatory requirements (such as antenna height, population density, etc.), site installation parameters (line loss between antenna and radio, antenna parameters, etc.) and base station operational parameters (MIMO operational setup, carrier power level, channel bandwidth, modulation type, etc.) to optimize performance. Transmitter output power may be reduced (from maximum) by base station setup parameters. Base station antennas are selected by the customer.

The base station antenna is selected by the customer and this EIRP calculation is based upon a sample worst case antenna. The EIRP calculation is based upon Kathrein antenna assembly model "80011867". The maximum Band n66 gain (18.2dBi) for this antenna was used for the EIRP calculation. This antenna assembly has a pair of $\pm 45^\circ$ cross-polarized radiators used for Band n66. The four antenna RF inputs (used for Band n66) on the antenna assembly are as follows: Y1+ L5 (+45°), Y1- L6 (-45°), Y2+ R7 (+45°) and Y2- R8 (-45°). Four AHFII transmitter outputs are connected to the antenna assembly RF inputs.

Equivalent Isotropically Radiated Power (EIRP) is calculated (as specified in ANSI C63.26-2015 section 6.4 for a system of correlated output signals) from the results of power measurements (highest measured PSD for each channel bandwidth type). The maximum antenna gain was used for this calculation. The cable loss between the antenna and transmitter is site dependent (will not be 0 dB) but for this worst case EIRP calculation 0 dB was used. Calculations of worst-case EIRP for four port MIMO are as follows:

Parameter	5 MHz Ch BW	10 MHz Ch BW	15 MHz Ch BW	20 MHz Ch BW	30 MHz Ch BW
Worst Case PSD/Antenna Port	42.8 dBm/MHz	39.9 dBm/MHz	39 dBm/MHz	37.9 dBm/MHz	36.3 dBm/MHz
Cable Loss (site dependent)	0 dB	0 dB	0 dB	0 dB	0 dB
Maximum Antenna Gain (G_{max})	18.2 dBi	18.2 dBi	18.2 dBi	18.2 dBi	18.2 dBi
Directional Gain = $G_{max} + 10\log(2)$	21.2 dBi	21.2 dBi	21.2 dBi	21.2 dBi	21.2 dBi
See Note 1					
EIRP for Antenna Y1 +45° EIRP for Ant Y1 +45° = PSD/ant port - Cable Loss + Dir Gain	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP for Antenna Y1 -45°	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP subtotal for Y1 +45° and Y1 -45° (See Note 2)	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP for Antenna Y2 +45°	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP for Antenna Y2 -45°	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP subtotal for Y2 +45° and Y2 -45° (See Note 2)	64 dBm/MHz	61.1 dBm/MHz	60.2 dBm/MHz	59.1 dBm/MHz	57.5 dBm/MHz
EIRP Total = Y1 ±45° and Y2 ±45° (See Note 3)	67 dBm/MHz	64.1 dBm/MHz	63.2 dBm/MHz	62.1 dBm/MHz	60.5 dBm/MHz

Note 1: The directional gain was calculated for two antennas since there are a pair of cross-polarized radiators. See ANSI C63.26 sections 6.4.5.3.3a) & 6.4.5.3.1a), and KDB 662911D01v02r01 paragraphs F)2)c)(i) & F)2)a)(i) for guidance.

Note 2: The EIRP per antenna polarity is required to be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the two transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Note 3: Antenna Y1 and Y2 are correlated - the EIRPs are required to be summed and be below the regulatory limit as described in ANSI C63.26-2015 section 6.4.6.3 b)3) and KDB 662911 D02v01 page 3 example (3).

Calculation Summary

The worst case AHFII four port MIMO Band n66 EIRP levels using antenna assembly model "80011867" are:

- (1) Less than the FCC and ISED (3280 W/MHz or 65.16 dBm/MHz) EIRP Regulatory Limits for 10, 15, 20 & 30MHz channel bandwidths.
- (2) Over the FCC/ISED (3280 W/MHz or 65.16 dBm/MHz) EIRP Regulatory Limits by 1.84 dB (67.0dBm/MHz - 65.16dBm/MHz) for the 5MHz channel bandwidth. EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements as noted above.
- (3) Less than the FCC and ISED (1640 W/MHz or 62.15 dBm/MHz) EIRP Regulatory Limits for 20 & 30MHz channel bandwidths.
- (4) Over the FCC/ISED (1640 W/MHz or 62.15 dBm/MHz) EIRP Regulatory Limits by 4.85 dB (67.0dBm/MHz - 62.15dBm/MHz) for the 5MHz channel bandwidth, by 1.95 dB (64.1dBm/MHz - 62.15dBm/MHz) for the 10MHz channel bandwidth, and by 1.05 dB (63.2dBm/MHz - 62.15dBm/MHz) for the 15MHz channel bandwidth. EIRP calculations are needed at each transmitter location to optimize base station operational performance while meeting regulatory requirements as noted above.
- (5) See "Output Power - Lowered Power" and the Power Spectral Density - Lowered Power" sections of this report for details of compliance verification by changing BTS configuration file power output parameters.