

OUTPUT POWER



XMH 2020.03.25.0

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	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21

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 (FHFB) as the original certification test. The FHFB 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



EUT: FHFB (FCC C2PC)

Serial Number: L9144200604

Customer: Nokia Solutions and Networks

Attendees: Mitchell Hill, John Rattanavong

Project: None

Tested by: Brandon Hobbs

Power: 54 VDC

Work Order: NOKI0021

Date: 10-Sep-20

Temperature: 22.5 °C

Humidity: 50.5% RH

Barometric Pres.: 1024 mbar

Job Site: TX05

TEST SPECIFICATIONS

FCC 24E:2020

RSS-133:2018

ANSI C63.26:2015

RSS-133:2018

COMMENTS

All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. The carrier power was set to maximum except for the 15MHz channel bandwidth band edge frequencies. The power was reduced by 1 dB at the 15MHz channel bandwidth "High Channel" (1987.5MHz) and "Low Channel" (1937.5MHz). 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 63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 log N_{out}). The total output power for two port operation is single port power + 3dB [i.e. 10log(2)]. The total output power for four port operation is single port power + 6dB [i.e. 10log(4)].

DEVIATIONS FROM TEST STANDARD

None

Configuration #

2

Signature



Initial Value

Duty Cycle

Single Port

Two Port (2x2 MIMO)

Four Port (4x4 MIMO)

dBm/Carrier BW

dBm/Carrier BW

dBm/Carrier BW

dBm/Carrier BW

dBm/Carrier BW

Band 25, 1930 MHz - 1995 MHz, 5G

Port 1

5 MHz Bandwidth

QPSK Modulation

Low Channel, 1932.5 MHz

45.924

0

45.9

48.9

51.9

Mid Channel, 1962.5 MHz

46.568

0

46.6

49.6

52.6

High Channel, 1992.5 MHz

46.112

0

46.1

49.1

52.1

16-QAM Modulation

Low Channel, 1932.5 MHz

45.880

0

45.9

48.9

51.9

Mid Channel, 1962.5 MHz

46.205

0

46.2

49.2

52.2

High Channel, 1992.5 MHz

45.894

0

45.9

48.9

51.9

64-QAM Modulation

Low Channel, 1932.5 MHz

46.091

0

46.1

49.1

52.1

Mid Channel, 1962.5 MHz

46.532

0

46.5

49.5

52.5

High Channel, 1992.5 MHz

46.048

0

46.0

49.0

52.0

256-QAM Modulation

Low Channel, 1932.5 MHz

45.997

0

46.0

49.0

52.0

Mid Channel, 1962.5 MHz

46.384

0

46.4

49.4

52.4

High Channel, 1992.5 MHz

45.942

0

45.9

48.9

51.9

10 MHz Bandwidth

QPSK Modulation

Low Channel, 1935.0 MHz

46.300

0

46.3

49.3

52.3

Mid Channel, 1962.5 MHz

46.510

0

46.5

49.5

52.5

High Channel, 1990 MHz

46.225

0

46.2

49.2

52.2

16-QAM Modulation

Low Channel, 1935.0 MHz

46.006

0

46.0

49.0

52.0

Mid Channel, 1962.5 MHz

46.330

0

46.3

49.3

52.3

High Channel, 1990 MHz

46.115

0

46.1

49.1

52.1

64-QAM Modulation

Low Channel, 1935.0 MHz

46.138

0

46.1

49.1

52.1

Mid Channel, 1962.5 MHz

46.373

0

46.4

49.4

52.4

High Channel, 1990 MHz

46.224

0

46.2

49.2

52.2

256-QAM Modulation

Low Channel, 1935.0 MHz

46.059

0

46.1

49.1

52.1

Mid Channel, 1962.5 MHz

46.323

0

46.3

49.3

52.3

High Channel, 1990 MHz

46.148

0

46.1

49.1

52.1

15 MHz Bandwidth

QPSK Modulation

Low Channel, 1937.5 MHz

45.289

0

45.3

48.3

51.3

Mid Channel, 1962.5 MHz

46.473

0

46.5

49.5

52.5

High Channel, 1987.5 MHz

45.528

0

45.5

48.5

51.5

16-QAM Modulation

Low Channel, 1937.5 MHz

45.215

0

45.2

48.2

51.2

Mid Channel, 1962.5 MHz

46.356

0

46.4

49.4

52.4

High Channel, 1987.5 MHz

45.363

0

45.4

48.4

51.4

64-QAM Modulation

Low Channel, 1937.5 MHz

45.270

0

45.3

48.3

51.3

Mid Channel, 1962.5 MHz

46.370

0

46.4

49.4

52.4

High Channel, 1987.5 MHz

45.430

0

45.4

48.4

51.4

256-QAM Modulation

Low Channel, 1937.5 MHz

45.285

0

45.3

48.3

51.3

Mid Channel, 1962.5 MHz

46.377

0

46.4

49.4

52.4

High Channel, 1987.5 MHz

45.392

0

45.4

48.4

51.4

20 MHz Bandwidth

QPSK Modulation

Low Channel, 1940 MHz

46.379

0

46.4

49.4

52.4

Mid Channel, 1962.5 MHz

46.537

0

46.5

49.5

52.5

High Channel, 1985 MHz

45.637

0

45.6

48.6

51.6

16-QAM Modulation

Low Channel, 1940 MHz

46.300

0

46.3

49.3

52.3

Mid Channel, 1962.5 MHz

46.436

0

46.4

49.4

52.4

High Channel, 1985 MHz

45.486

0

45.5

48.5

51.5

64-QAM Modulation

Low Channel, 1940 MHz

46.362

0

46.4

49.4

52.4

Mid Channel, 1962.5 MHz

46.480

0

46.5

49.5

52.5

High Channel, 1985 MHz

45.525

0

45.5

48.5

51.5

256-QAM Modulation

Low Channel, 1940 MHz

46.388

0

46.4

49.4

52.4

Mid Channel, 1962.5 MHz

46.466

0

46.5

49.5

52.5

High Channel, 1985 MHz

45.511

0

45.5

48.5

51.5

TbTx 2020.09.08.0 BETA

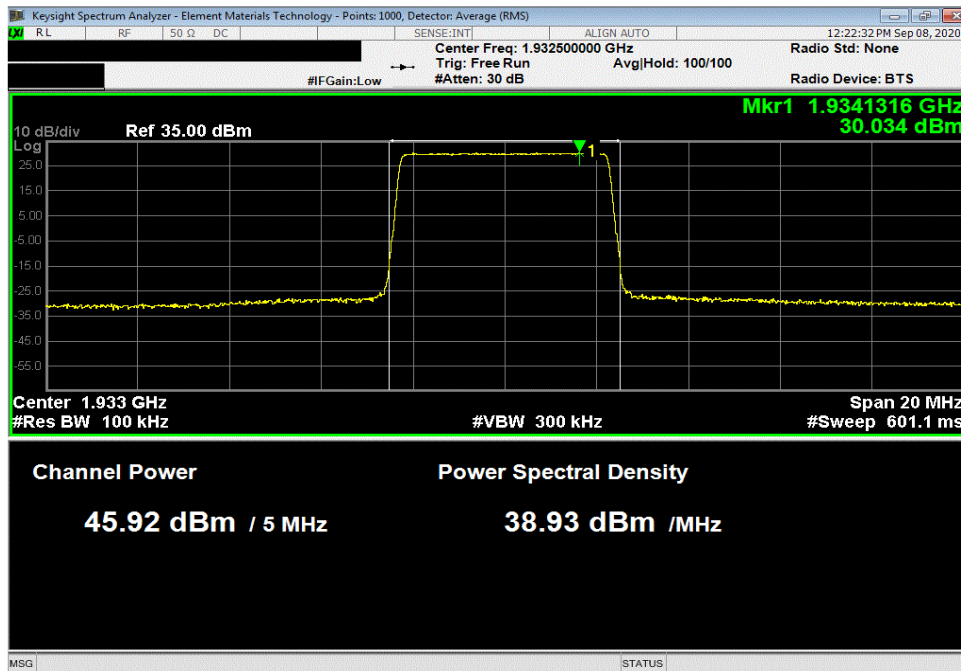
XMM 2020.03.25

OUTPUT POWER

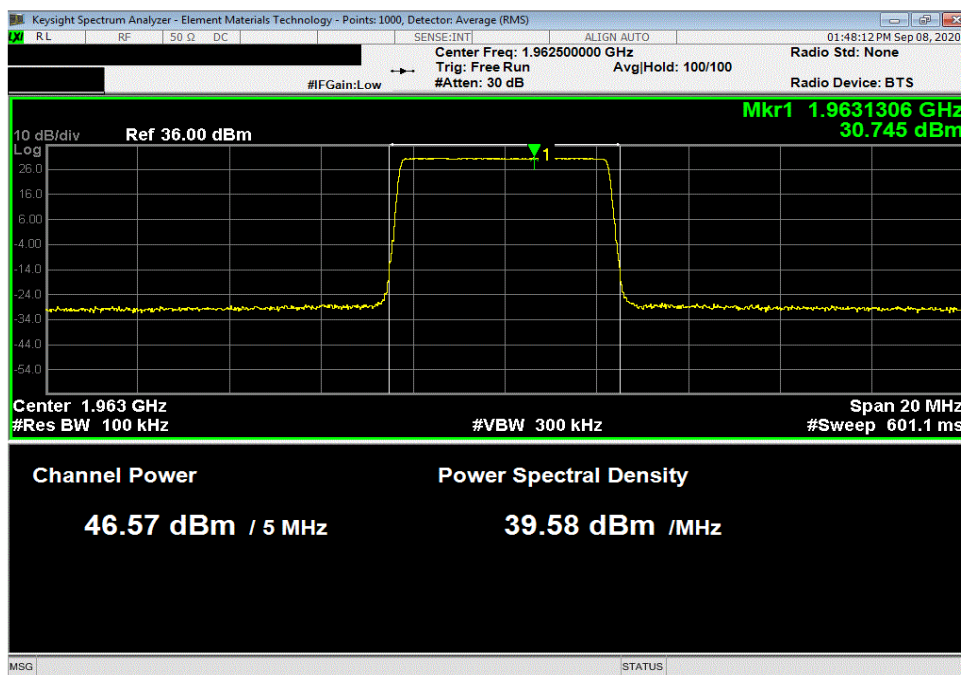


TMTx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.924	0	45.924	48.924	51.924	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.568	0	46.568	49.568	52.568	

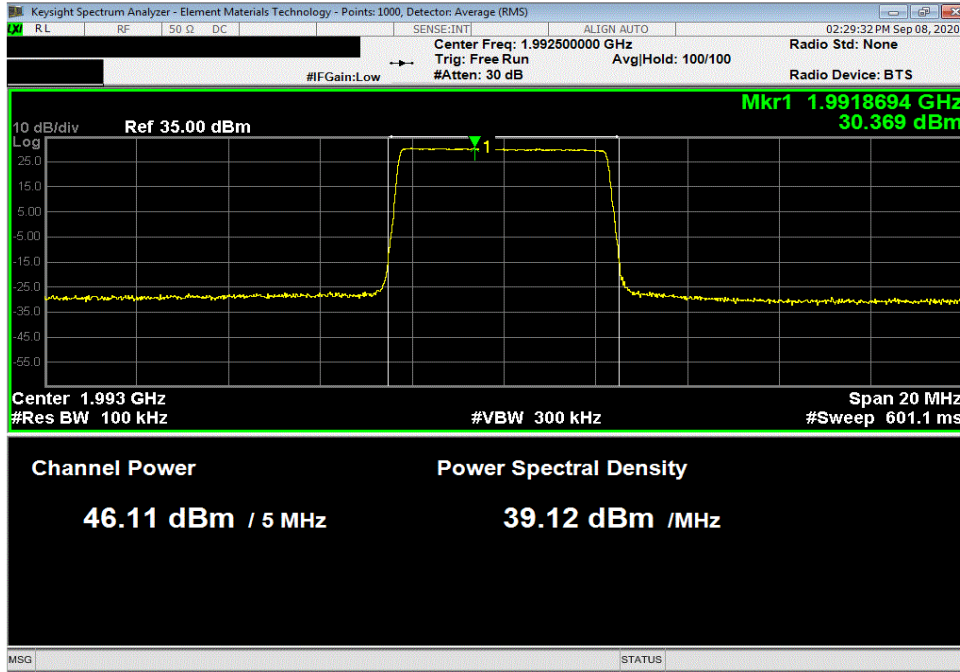


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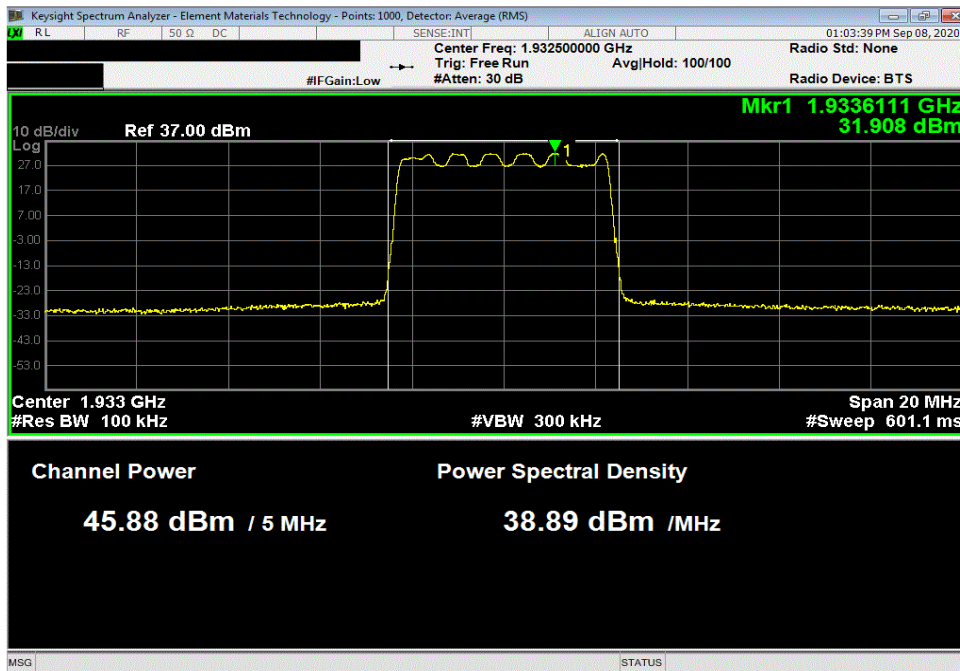


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.112	0	46.112	49.112	52.112	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.88	0	45.88	48.88	51.88	

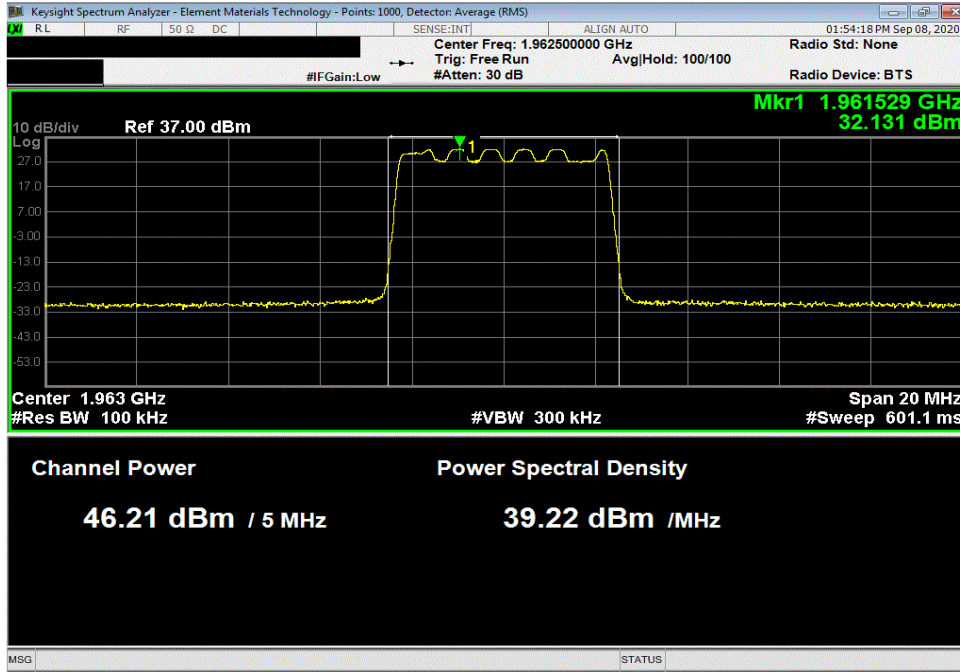


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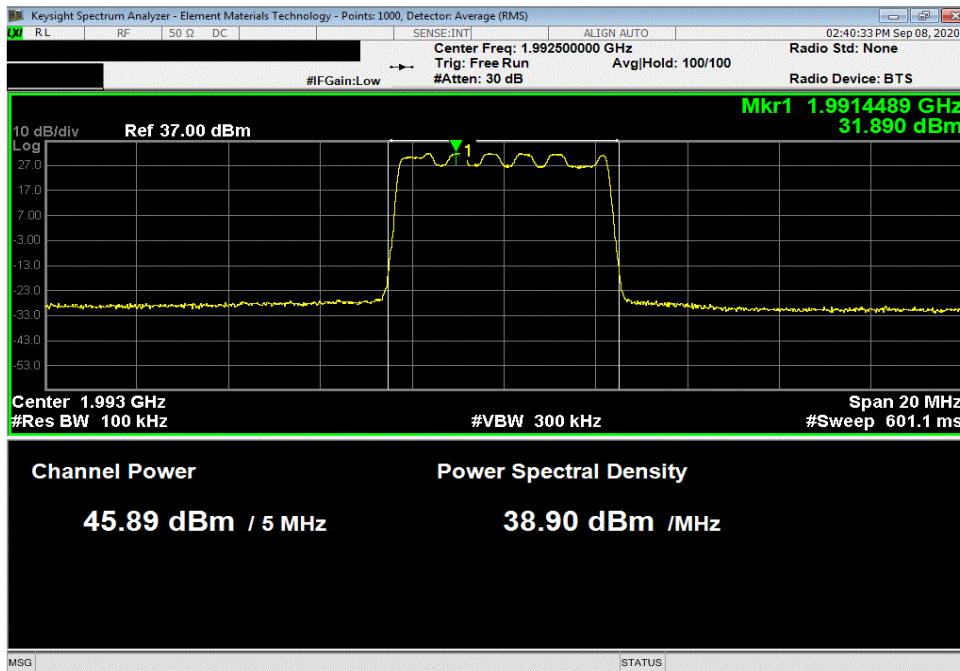


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.205	0	46.205	49.205	52.205	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.894	0	45.894	48.894	51.894	

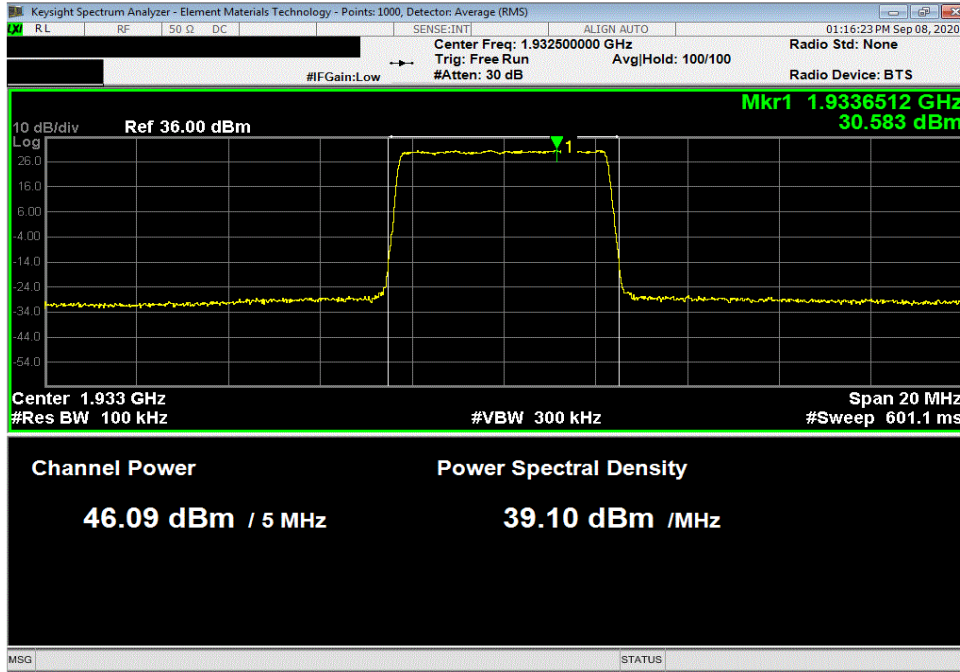


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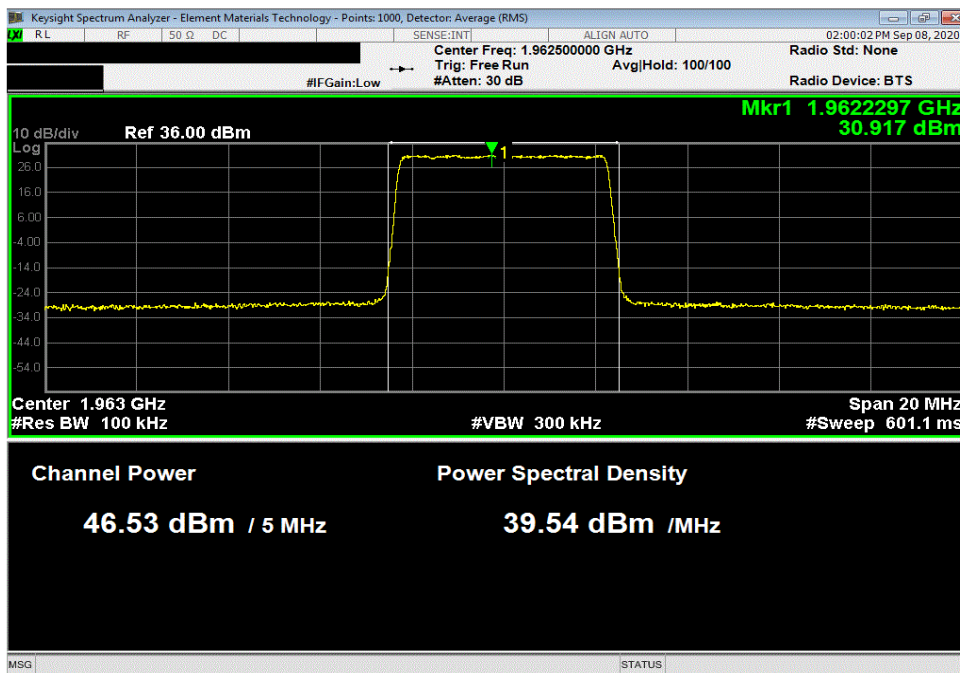


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.091	0	46.091	49.091	52.091	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.532	0	46.532	49.532	52.532	

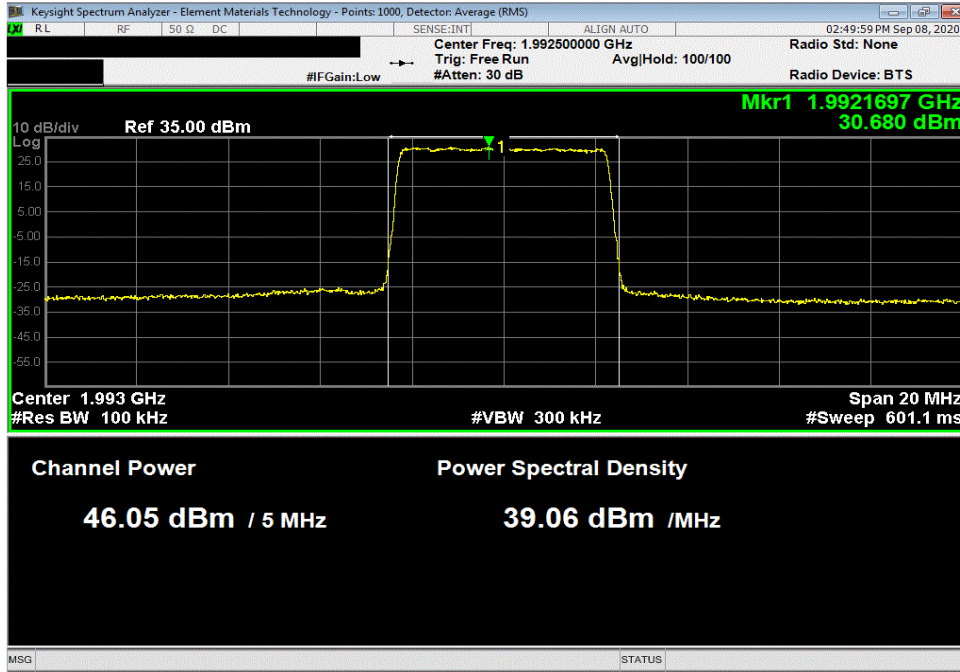


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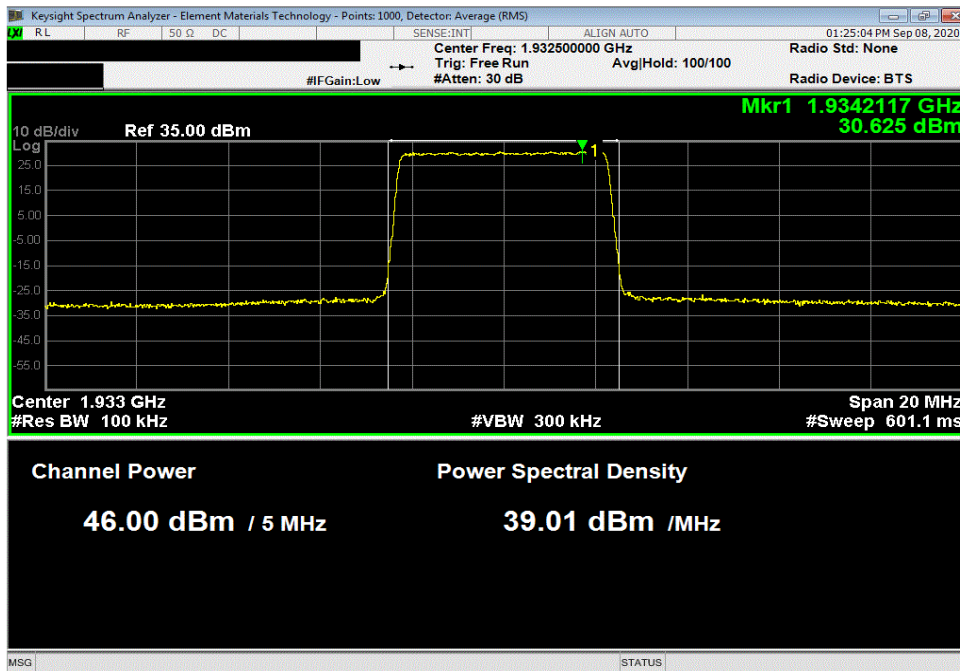


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.048	0	46.048	49.048	52.048	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.997	0	45.997	48.997	51.997	

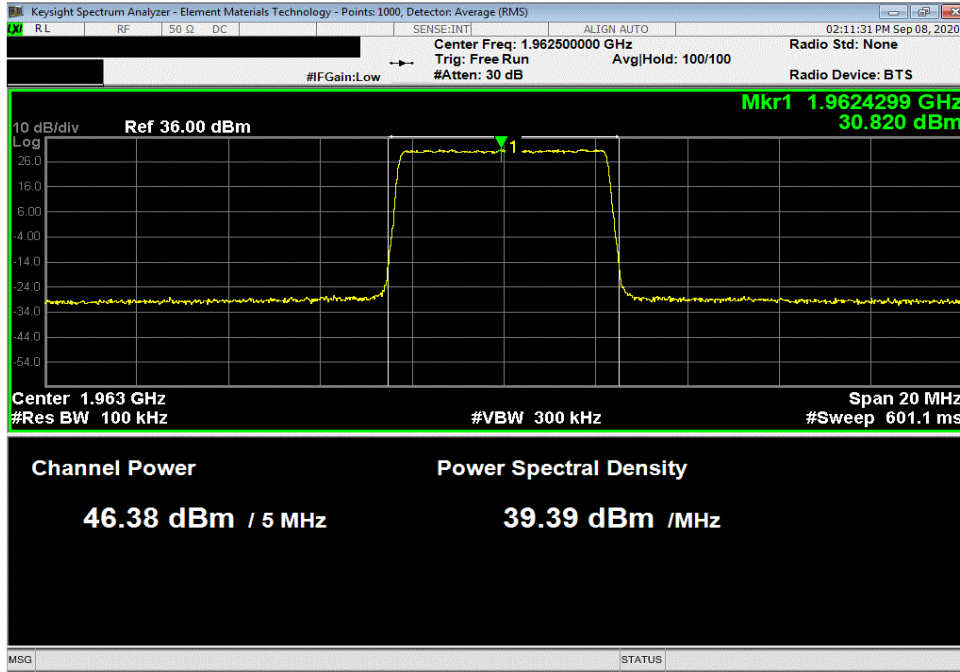


OUTPUT POWER

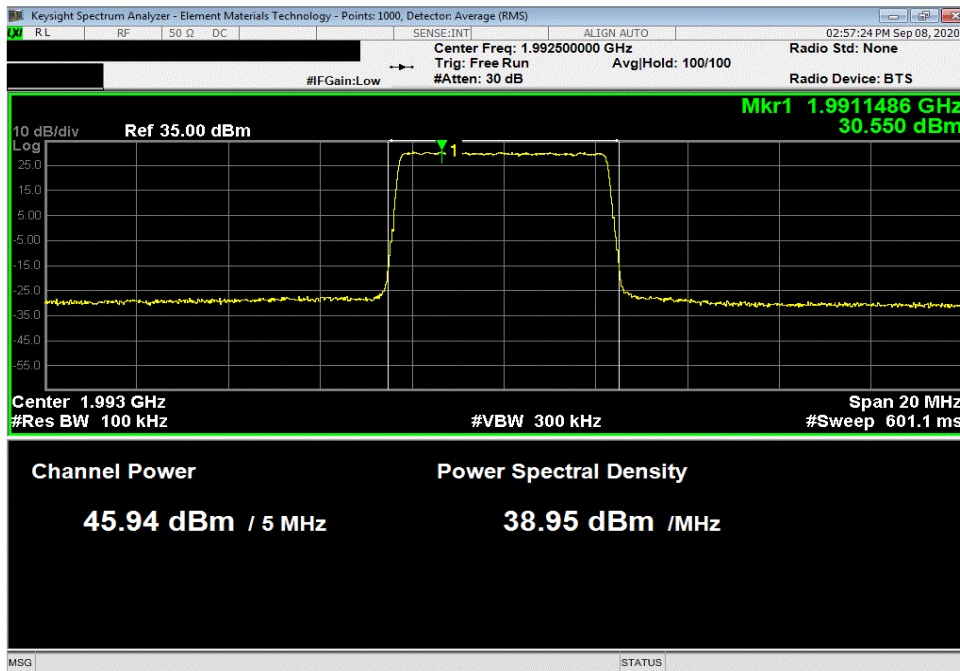


TMTx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.384	0	46.384	49.384	52.384	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.942	0	45.942	48.942	51.942	

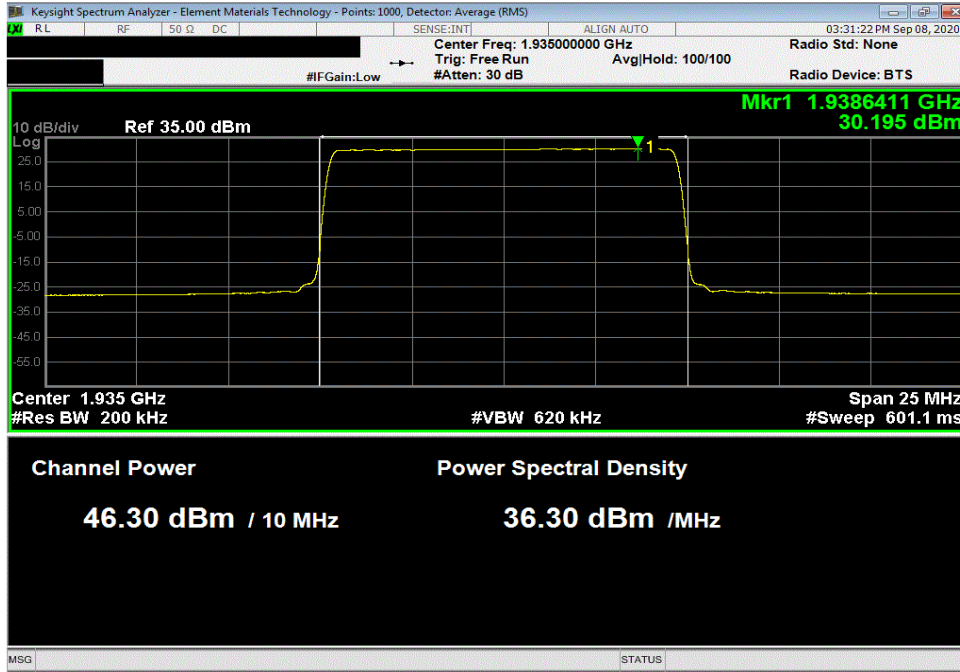


OUTPUT POWER

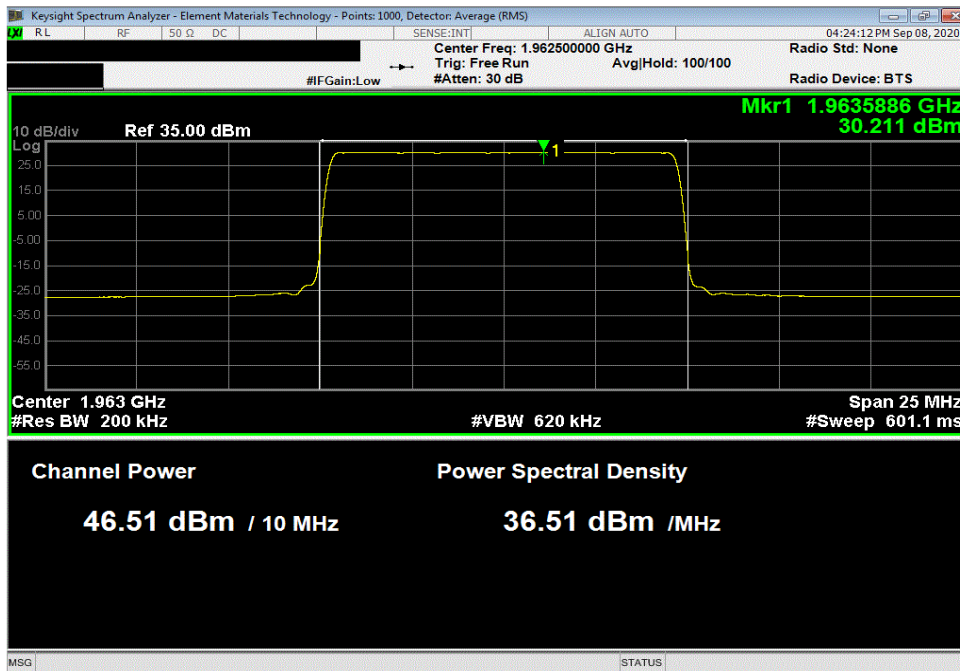


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, QPSK Modulation , Low Channel, 1935.0 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.3	0	46.3	49.3	52.3	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.51	0	46.51	49.51	52.51	

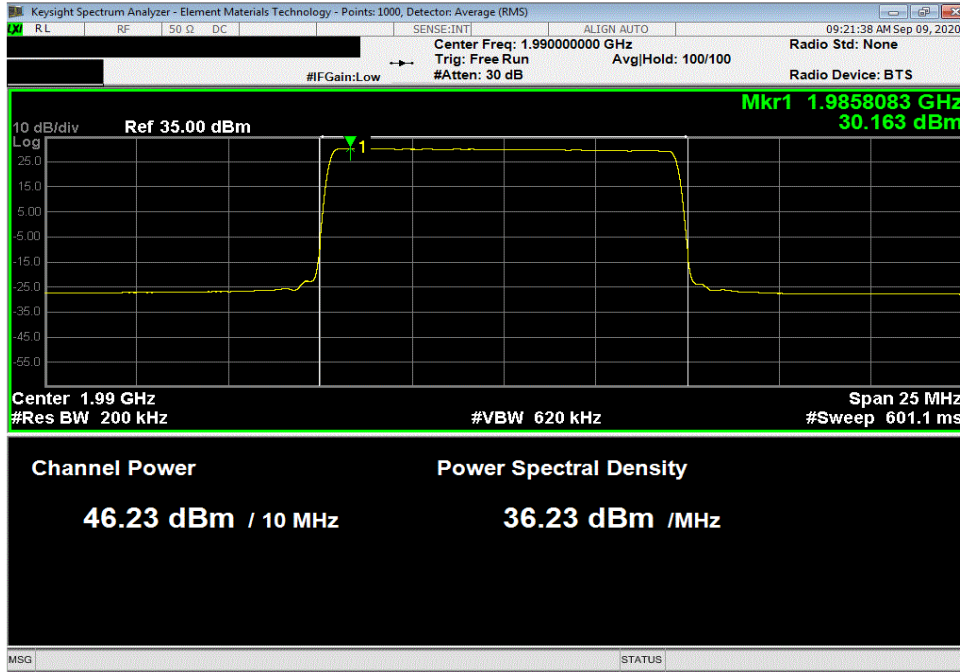


OUTPUT POWER

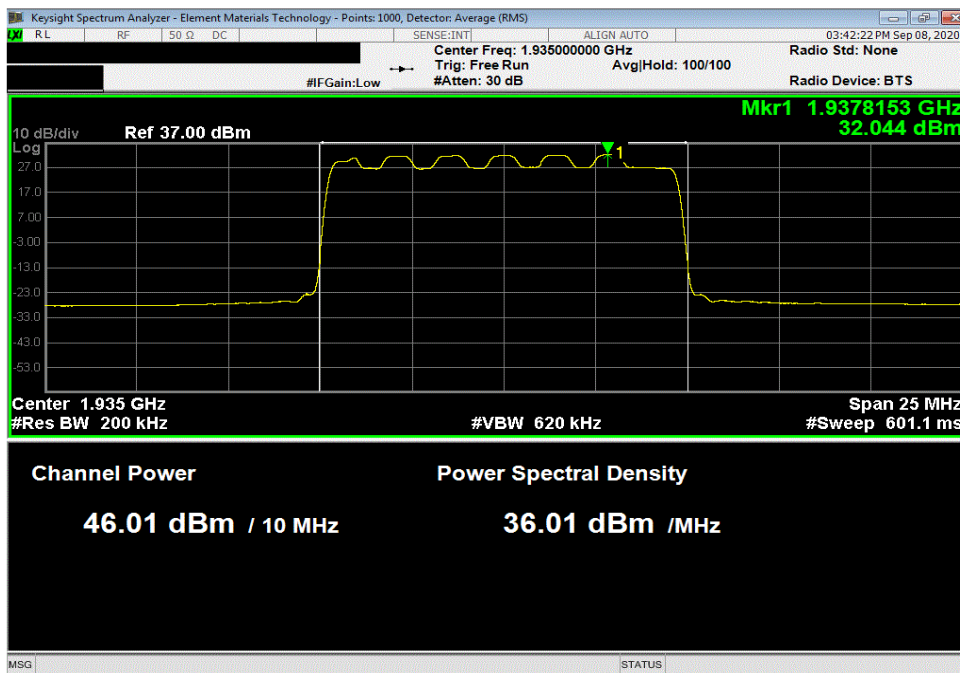


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, QPSK Modulation, High Channel, 1990 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.225	0	46.225	49.225	52.225	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 16-QAM Modulation, Low Channel, 1935.0 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.006	0	46.006	49.006	52.006	

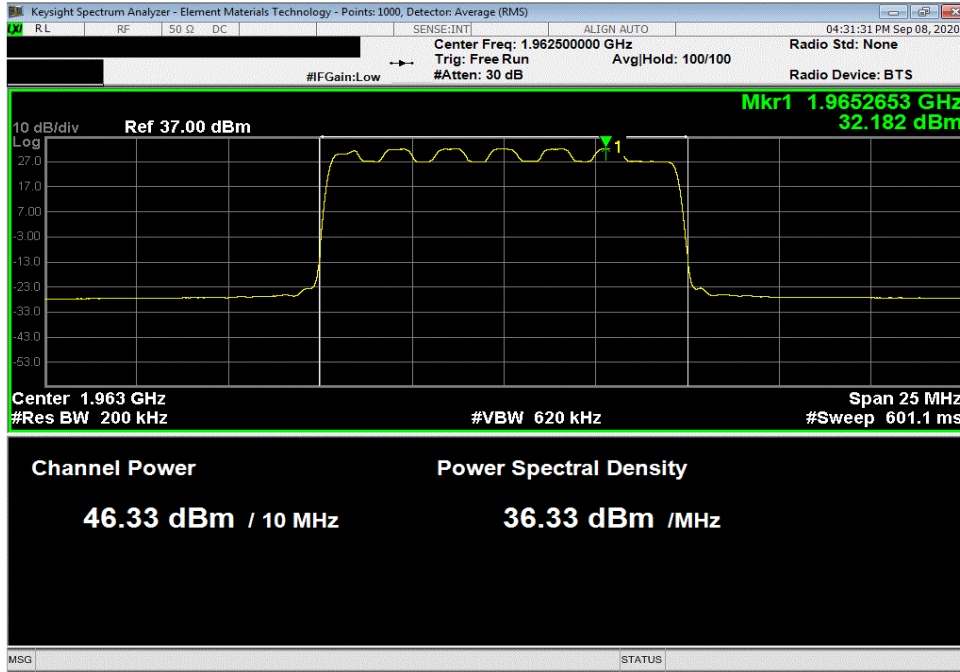


OUTPUT POWER

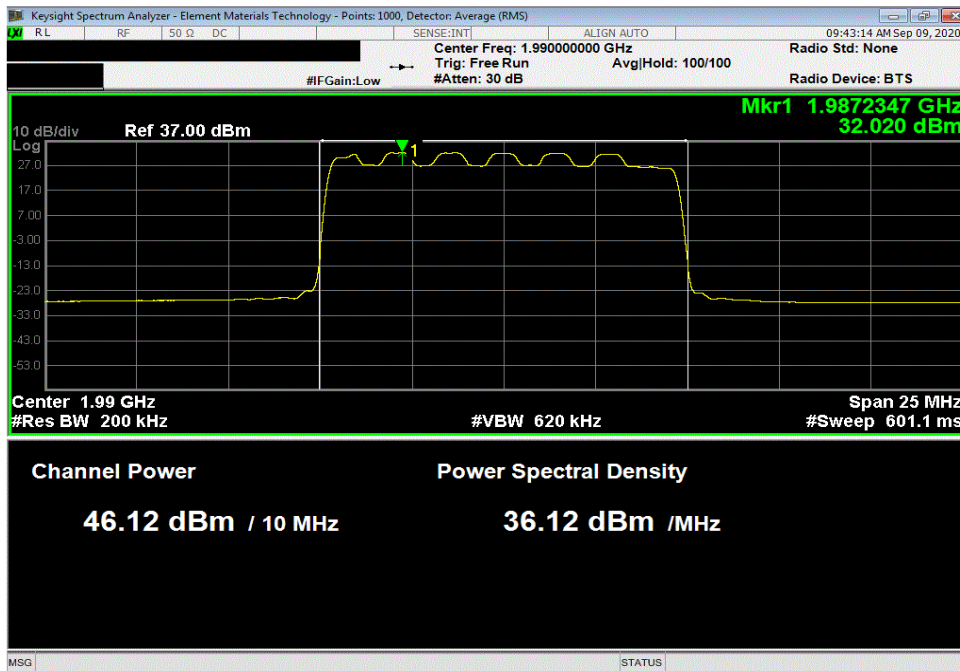


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.33	0	46.33	49.33	52.33	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 16-QAM Modulation, High Channel, 1990 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.115	0	46.115	49.115	52.115	

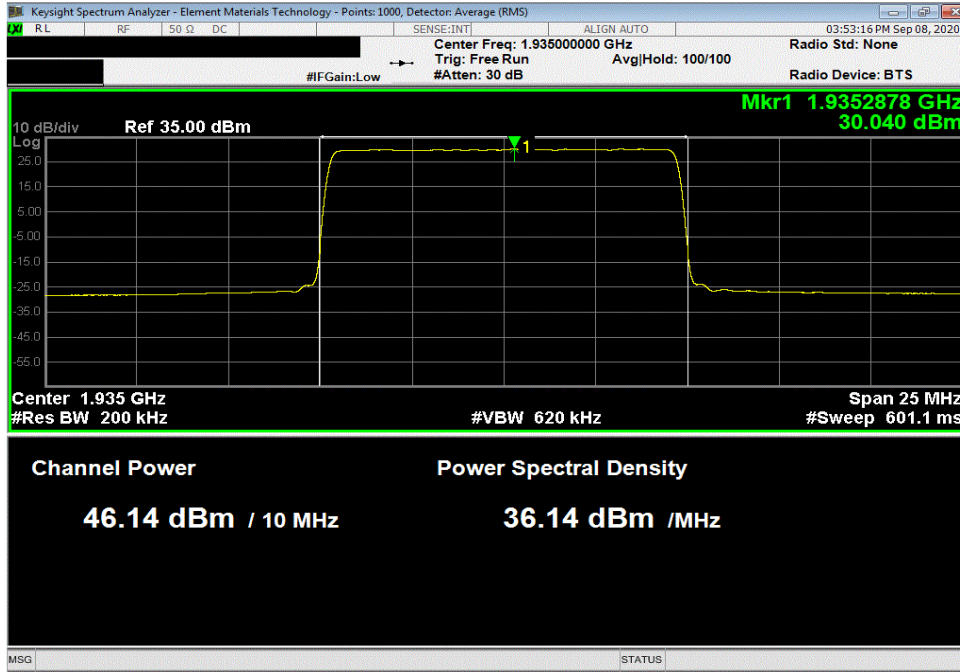


OUTPUT POWER

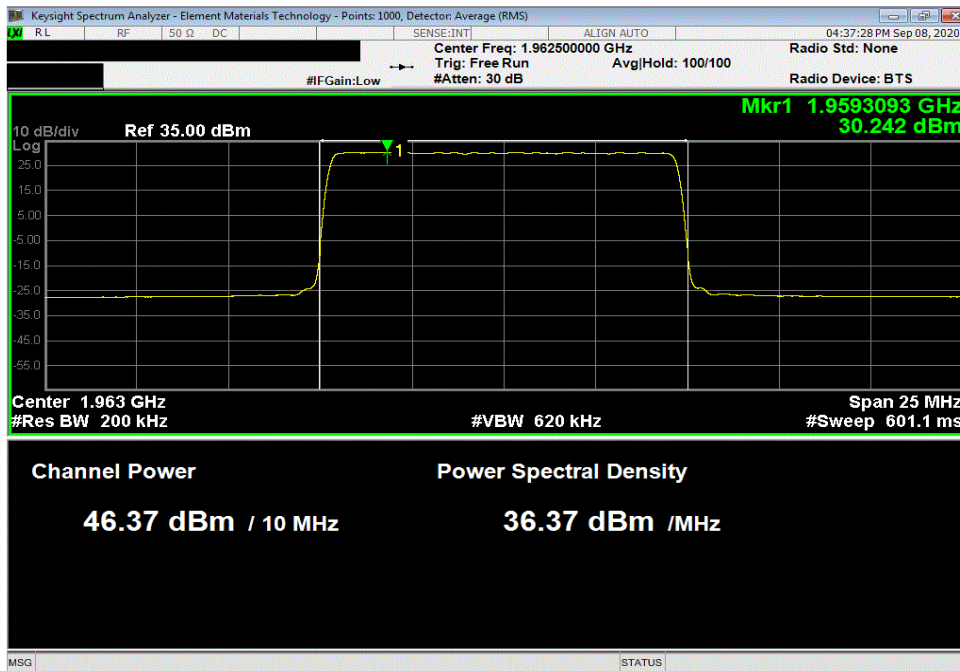


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 64-QAM Modulation, Low Channel, 1935.0 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.138	0	46.138	49.138	52.138	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.373	0	46.373	49.373	52.373	

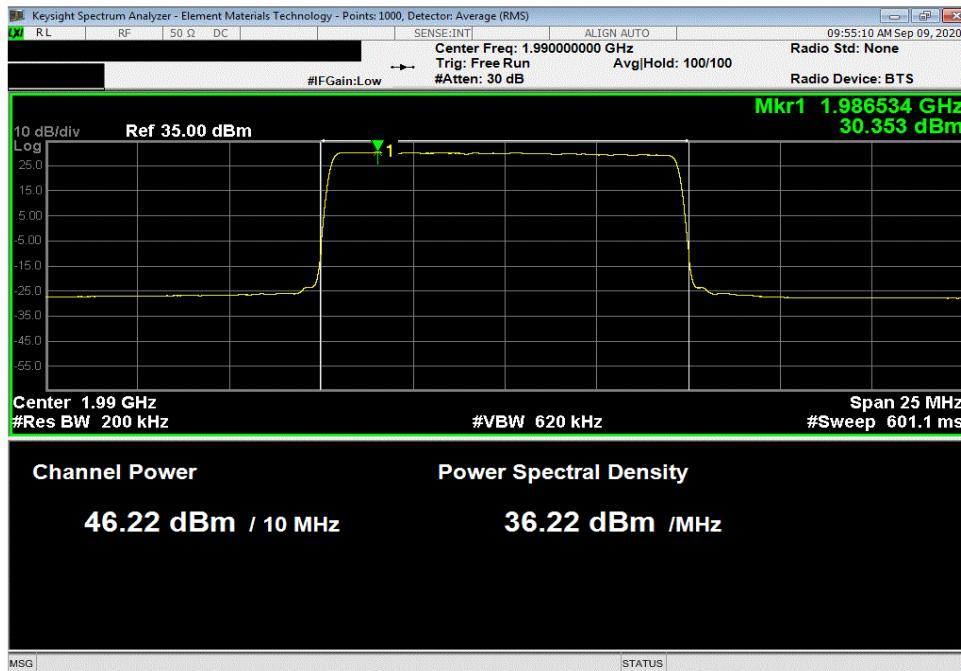


OUTPUT POWER

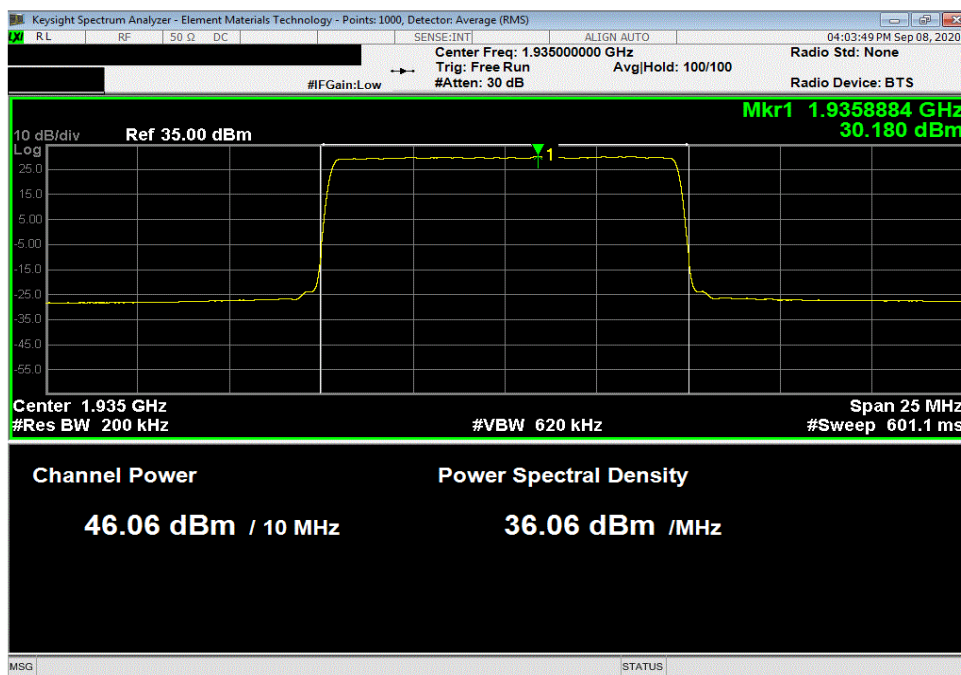


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 64-QAM Modulation, High Channel, 1990 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.224	0	46.224	49.224	52.224	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 256-QAM Modulation, Low Channel, 1935.0 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.059	0	46.059	49.059	52.059	

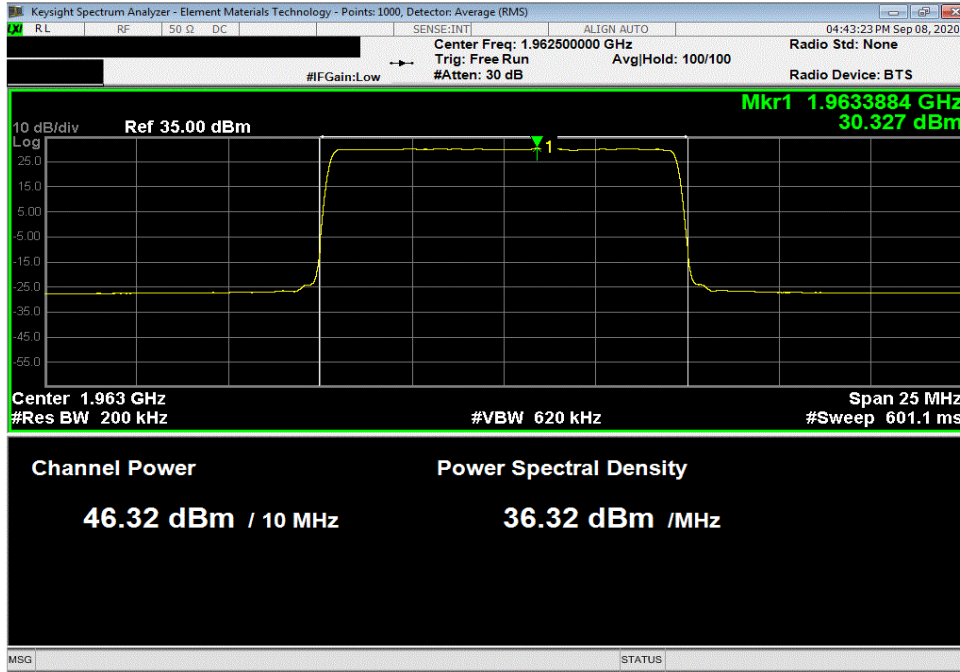


OUTPUT POWER

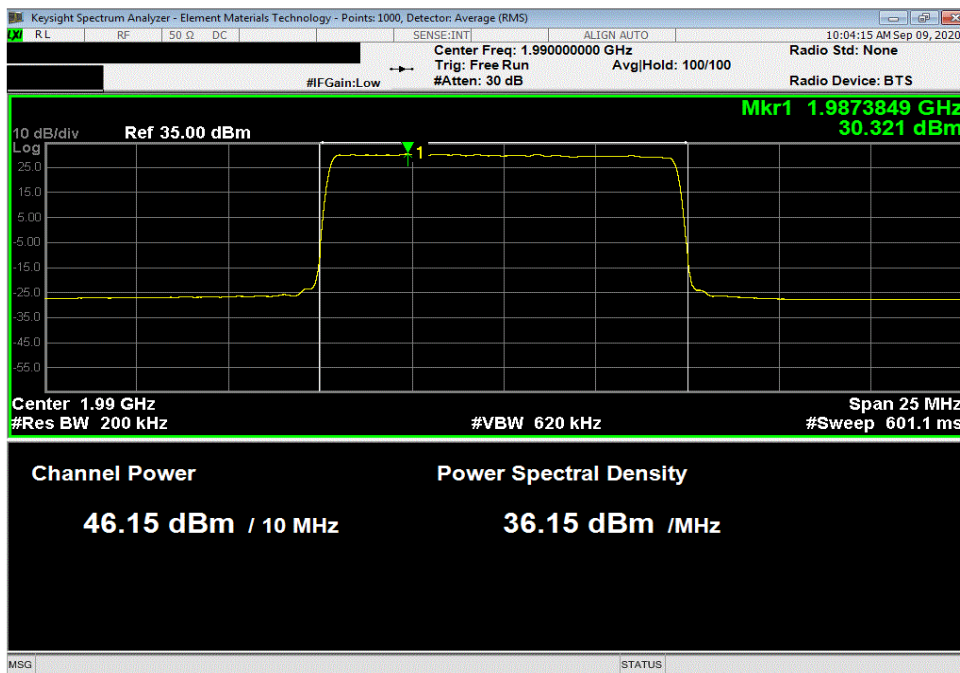


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.323	0	46.323	49.323	52.323	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwidth, 256-QAM Modulation, High Channel, 1990 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.148	0	46.148	49.148	52.148	

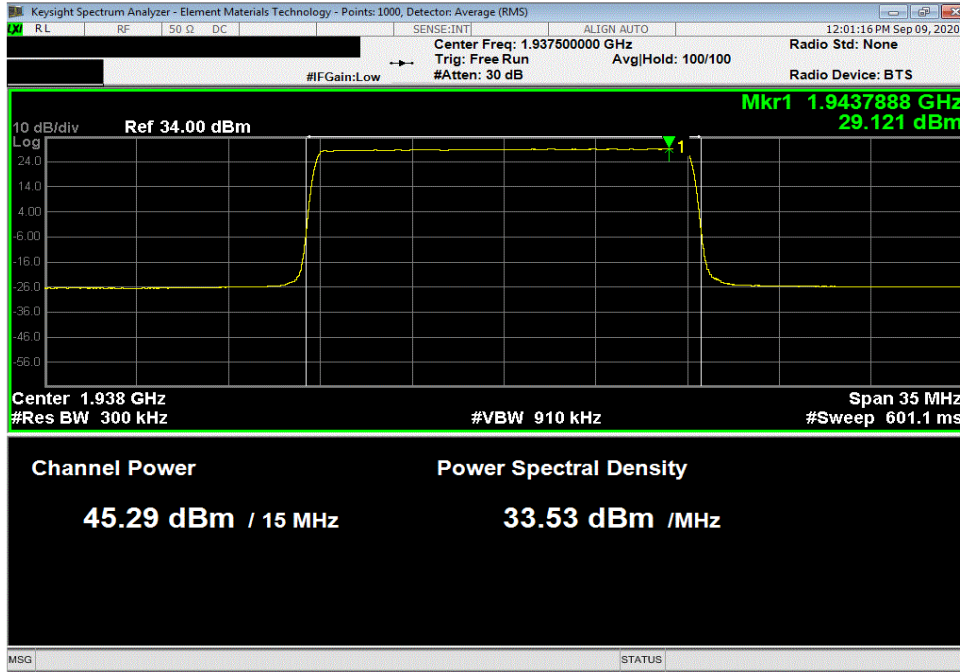


OUTPUT POWER

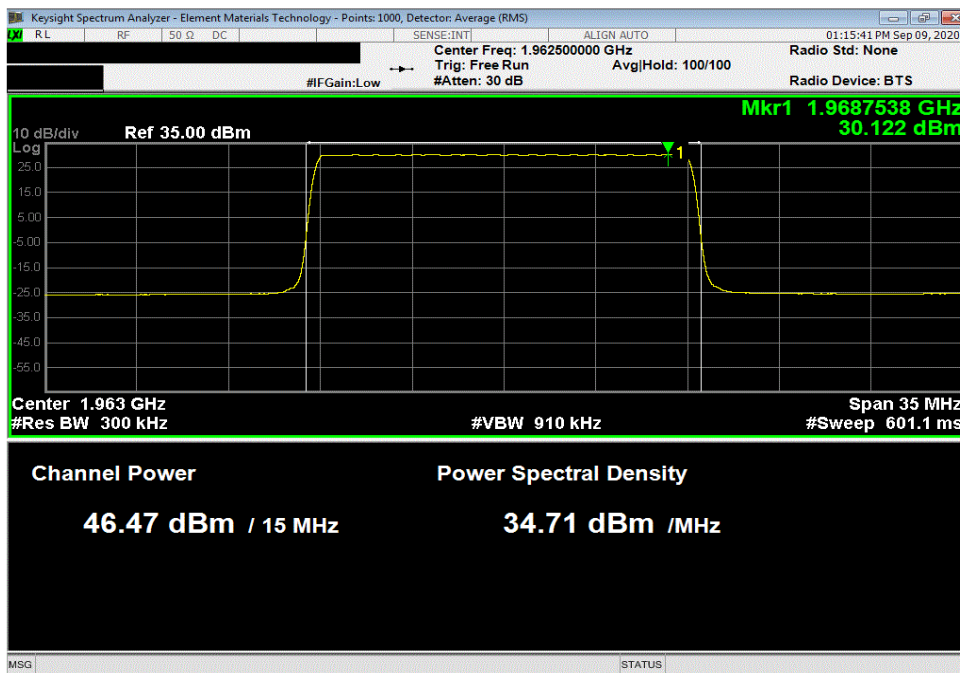


TN17x 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, QPSK Modulation , Low Channel, 1937.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.289	0	45.289	48.289	51.289	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.473	0	46.473	49.473	52.473	

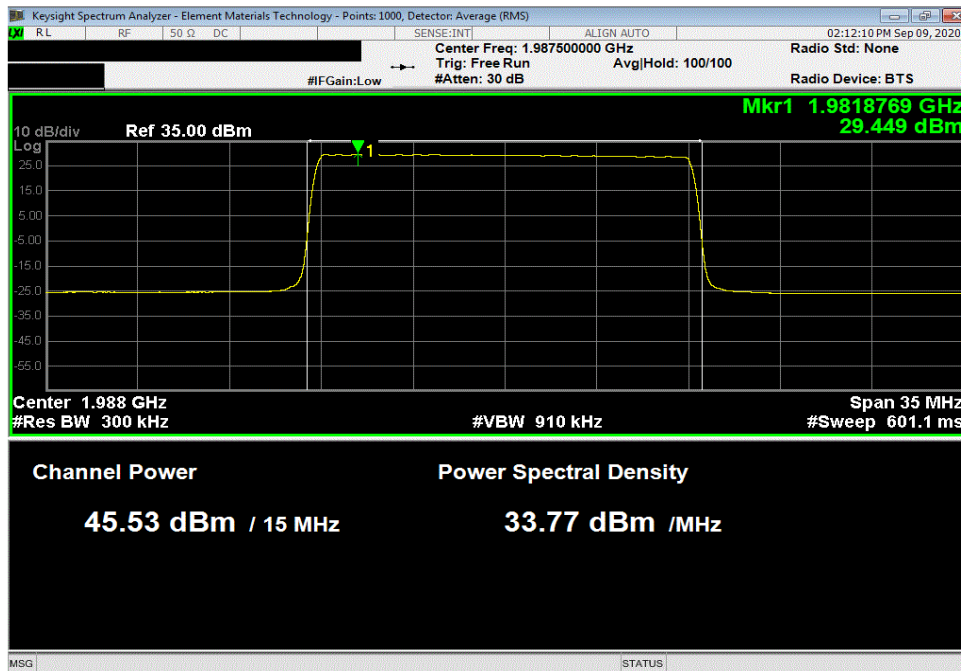


OUTPUT POWER

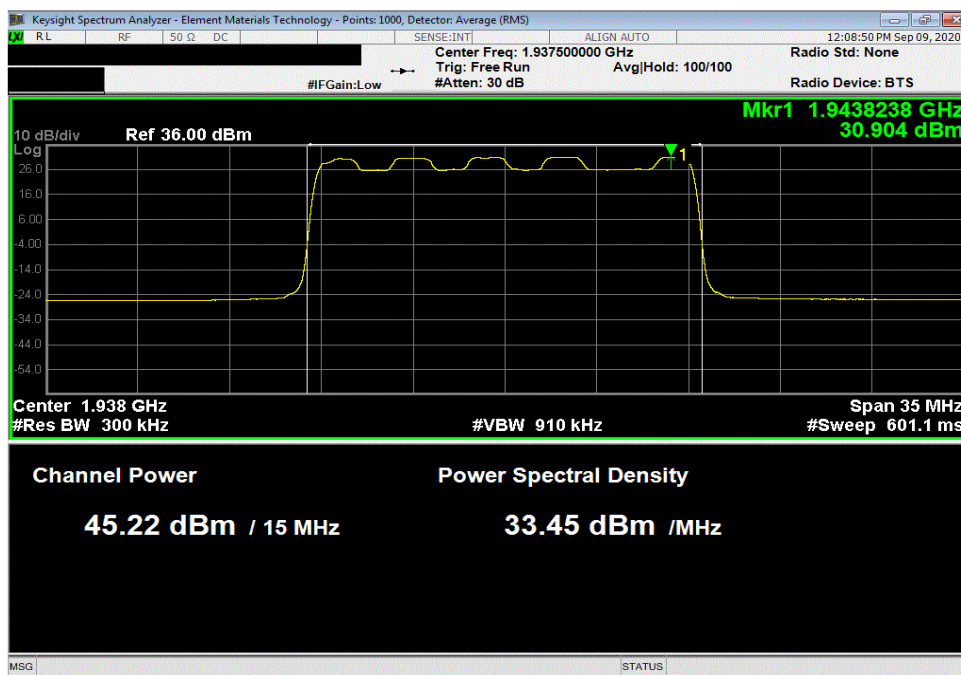


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, QPSK Modulation, High Channel, 1987.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.528	0	45.528	48.528	51.528	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 16-QAM Modulation, Low Channel, 1937.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.215	0	45.215	48.215	51.215	

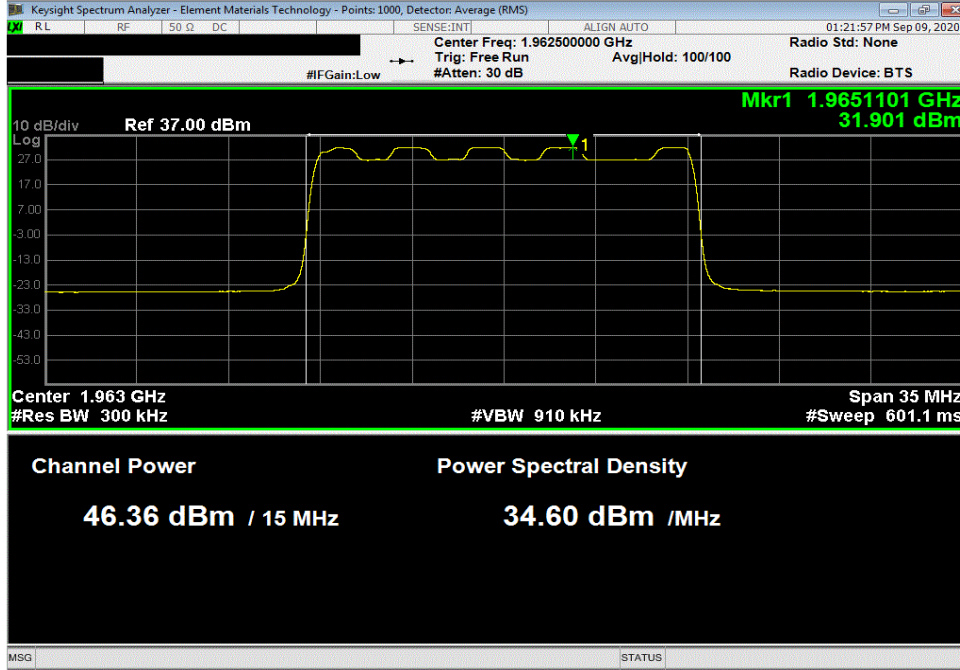


OUTPUT POWER

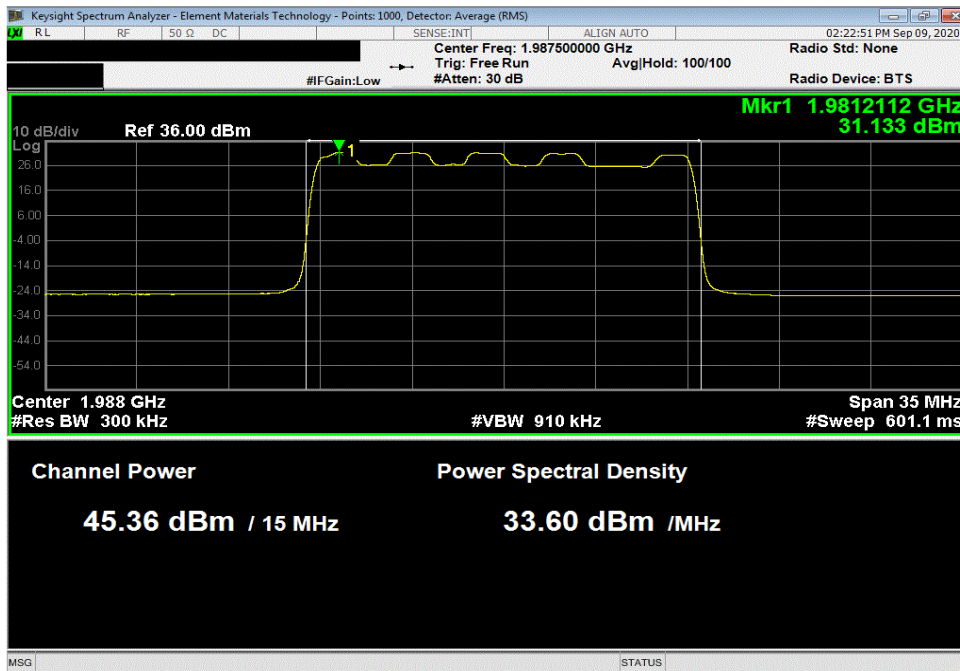


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.356	0	46.356	49.356	52.356	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 16-QAM Modulation, High Channel, 1987.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.363	0	45.363	48.363	51.363	

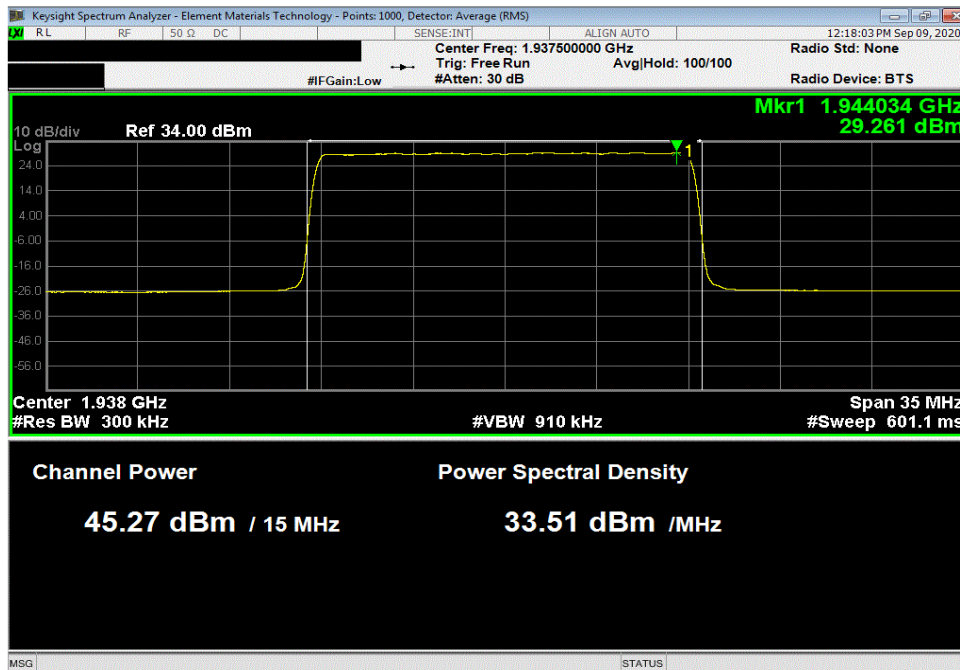


OUTPUT POWER

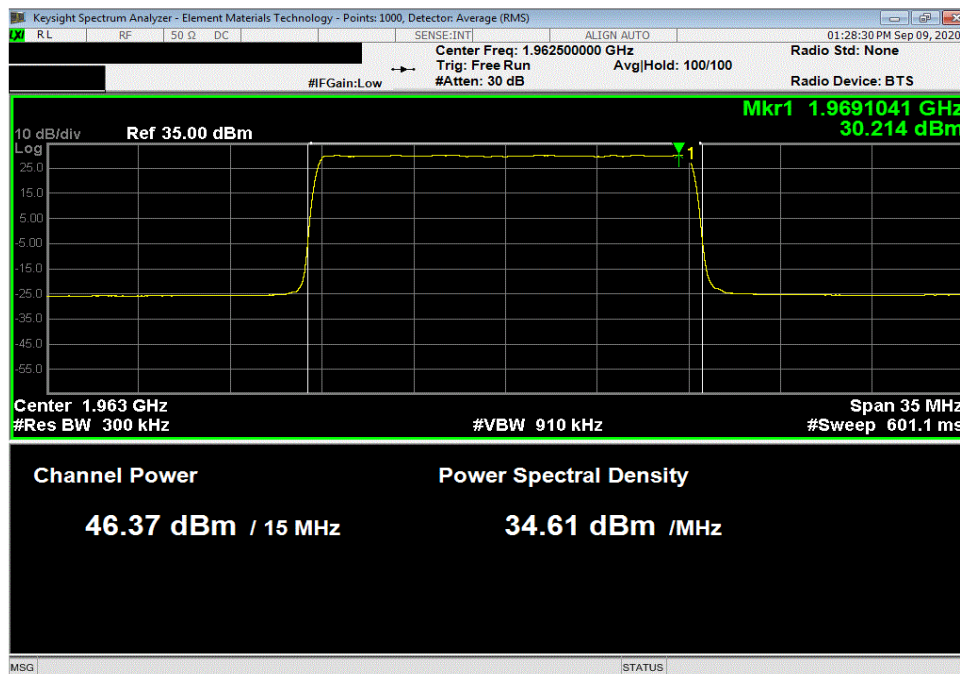


TMTx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 64-QAM Modulation, Low Channel, 1937.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.27	0	45.27	48.27	51.27	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.37	0	46.37	49.37	52.37	

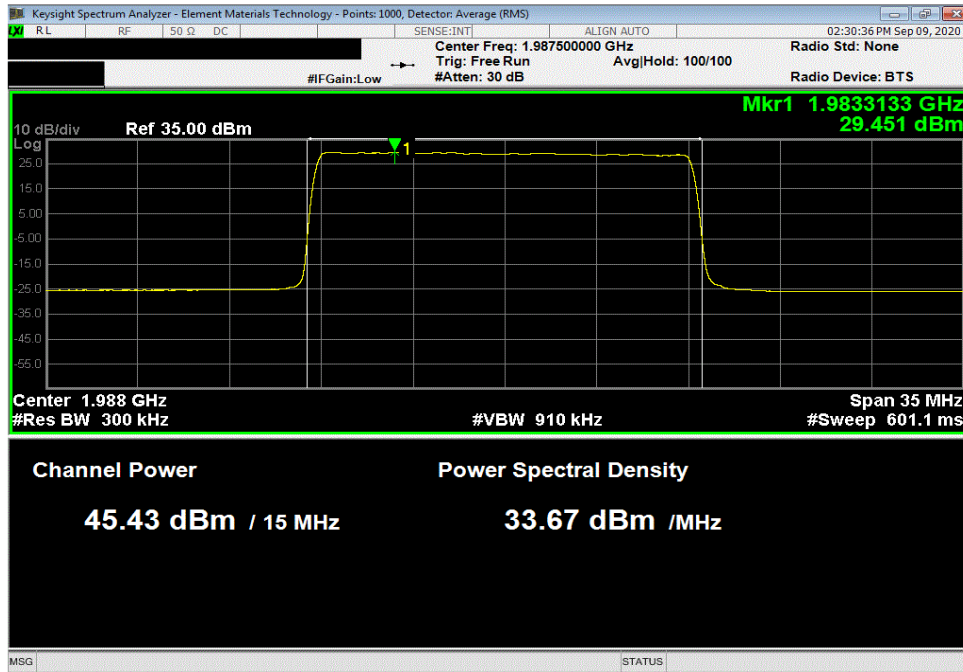


OUTPUT POWER

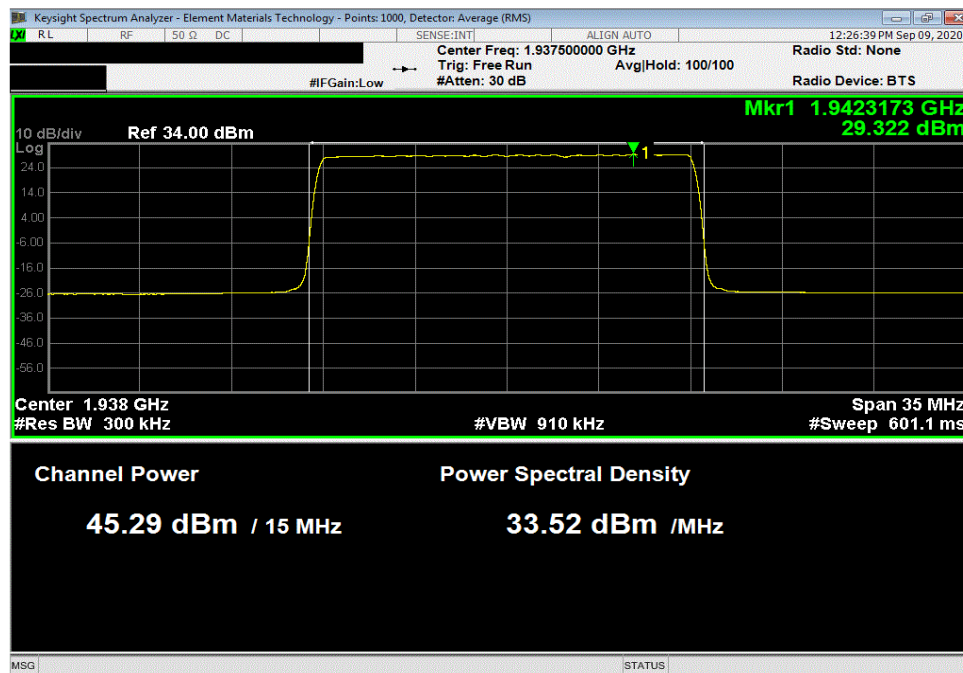


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 64-QAM Modulation, High Channel, 1987.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.43	0	45.43	48.43	51.43	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 256-QAM Modulation, Low Channel, 1937.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.285	0	45.285	48.285	51.285	

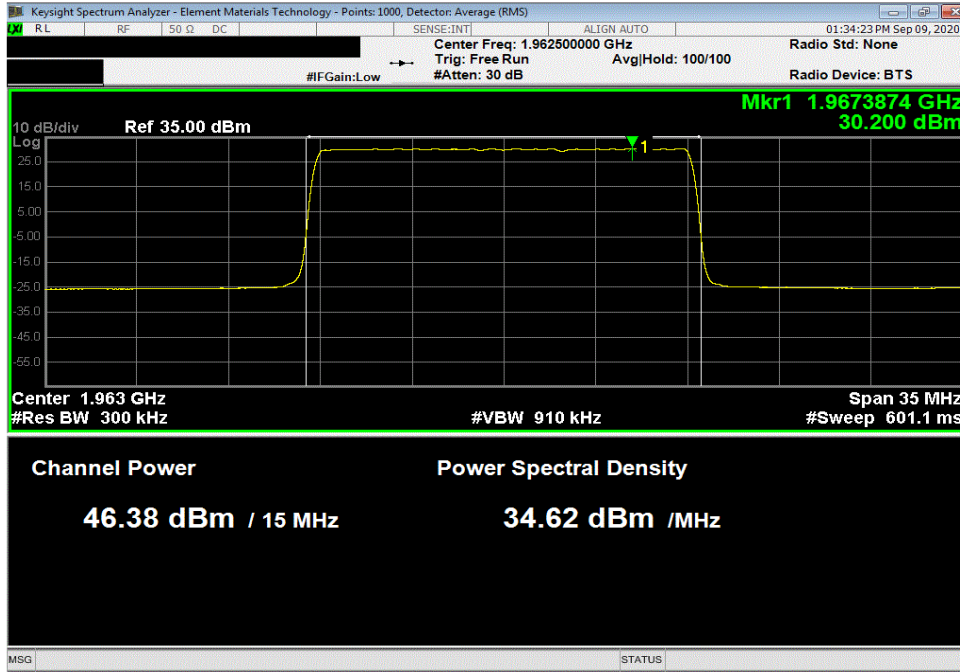


OUTPUT POWER

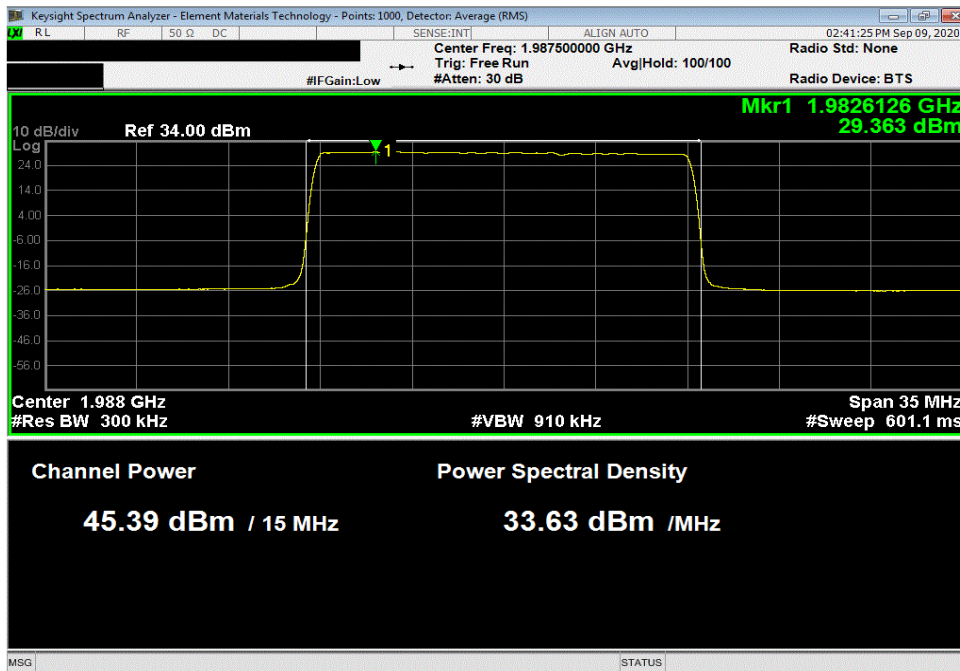


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.377	0	46.377	49.377	52.377	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwidth, 256-QAM Modulation, High Channel, 1987.5 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.392	0	45.392	48.392	51.392	

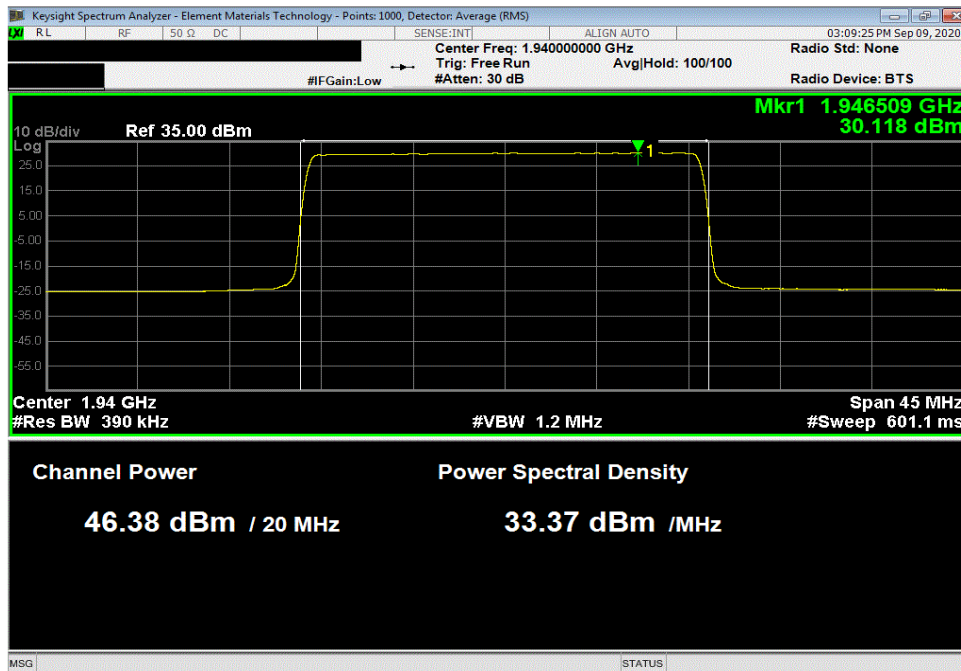


OUTPUT POWER

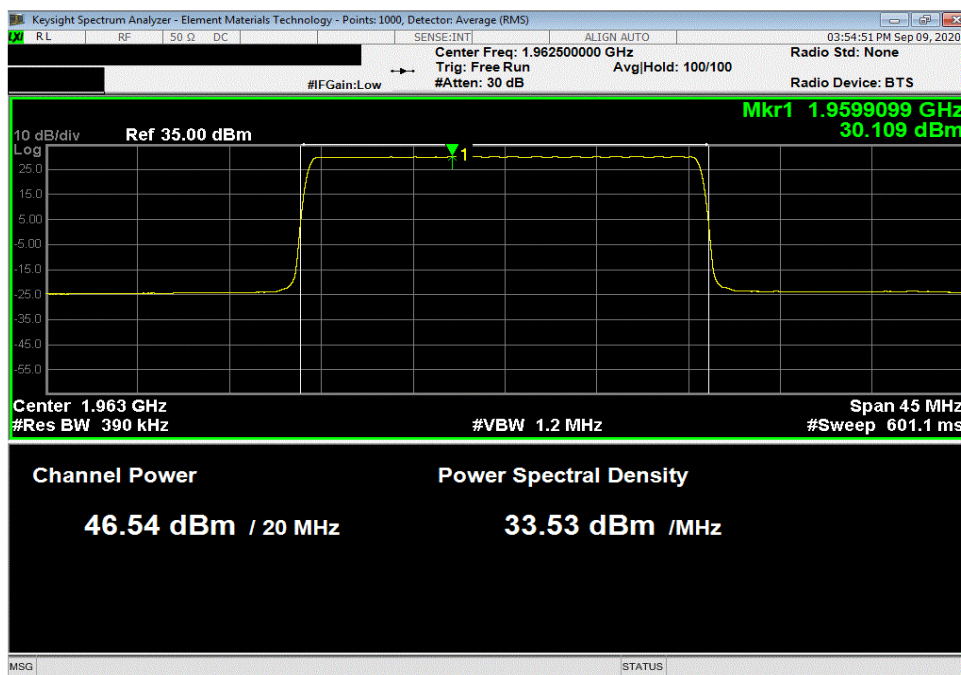


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, QPSK Modulation , Low Channel, 1940 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.379	0	46.379	49.379	52.379	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.537	0	46.537	49.537	52.537	

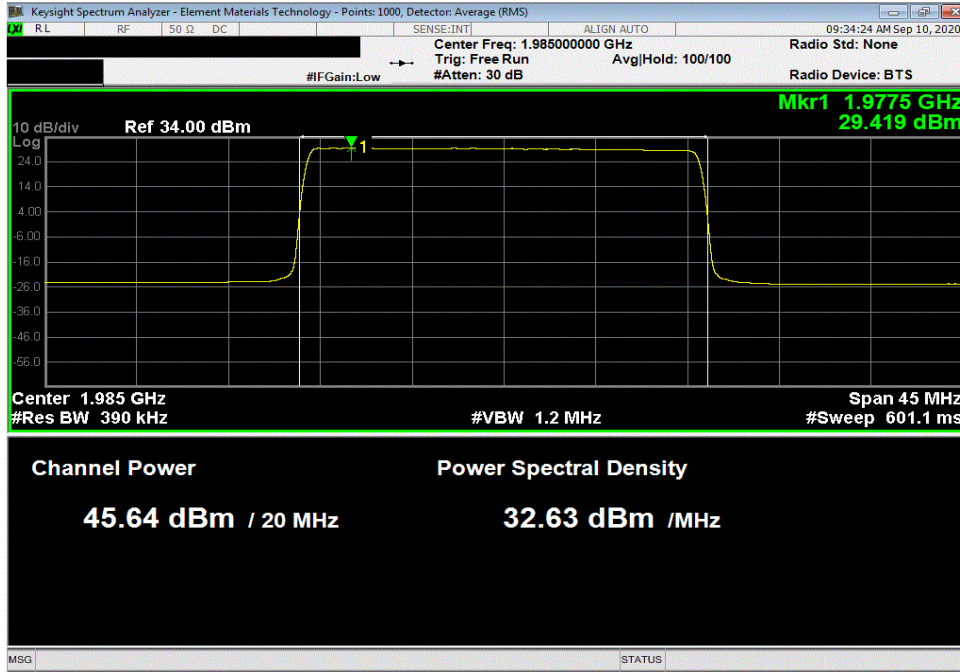


OUTPUT POWER

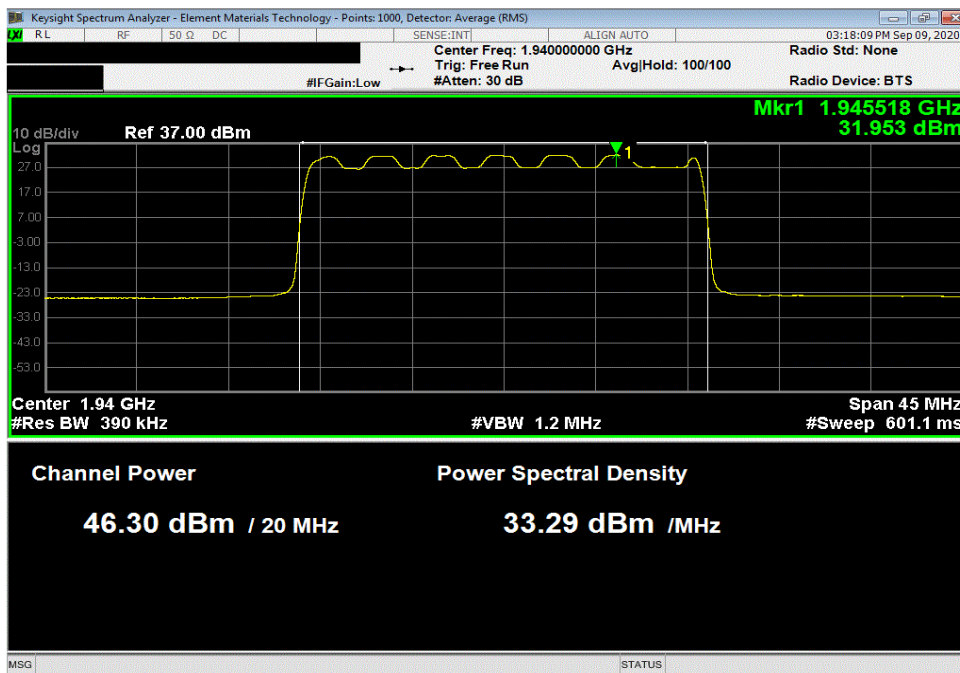


TN1Tx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, QPSK Modulation, High Channel, 1985 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.637	0	45.637	48.637	51.637	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 16-QAM Modulation, Low Channel, 1940 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.3	0	46.3	49.3	52.3	

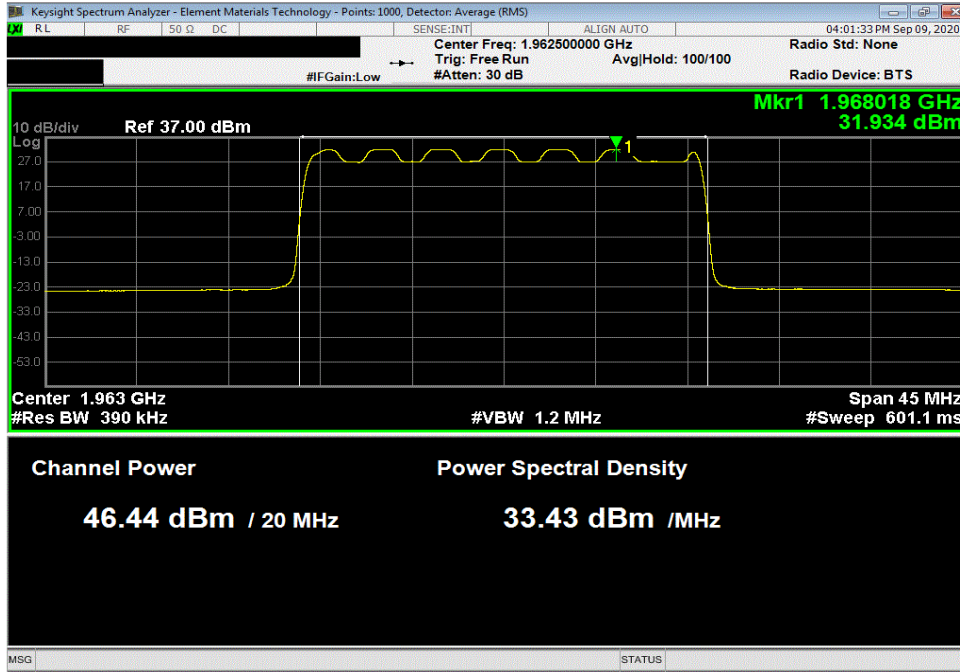


OUTPUT POWER

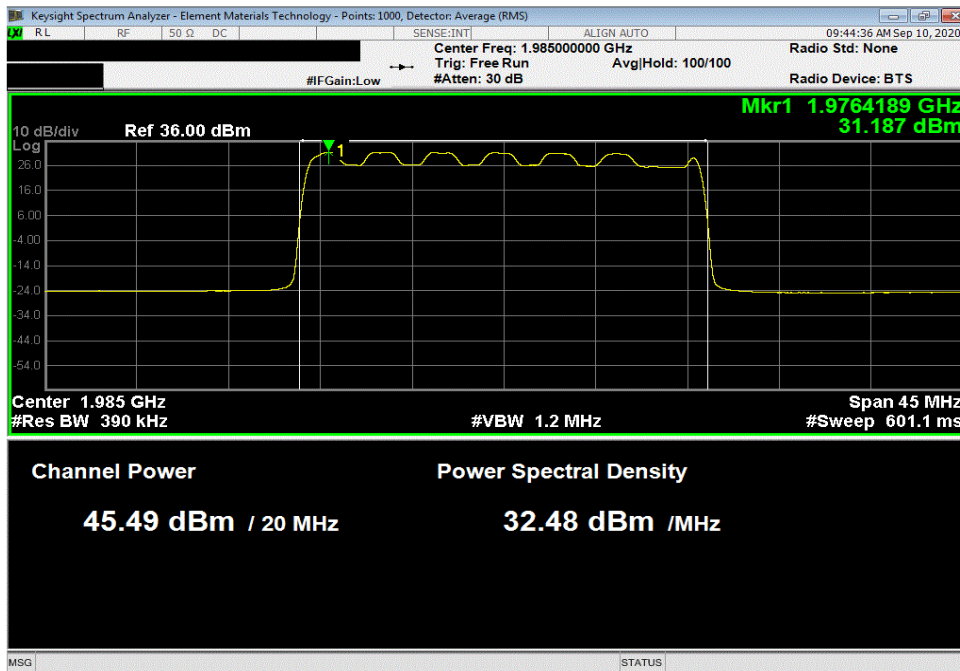


TMTx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.436	0	46.436	49.436	52.436	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 16-QAM Modulation, High Channel, 1985 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.486	0	45.486	48.486	51.486	

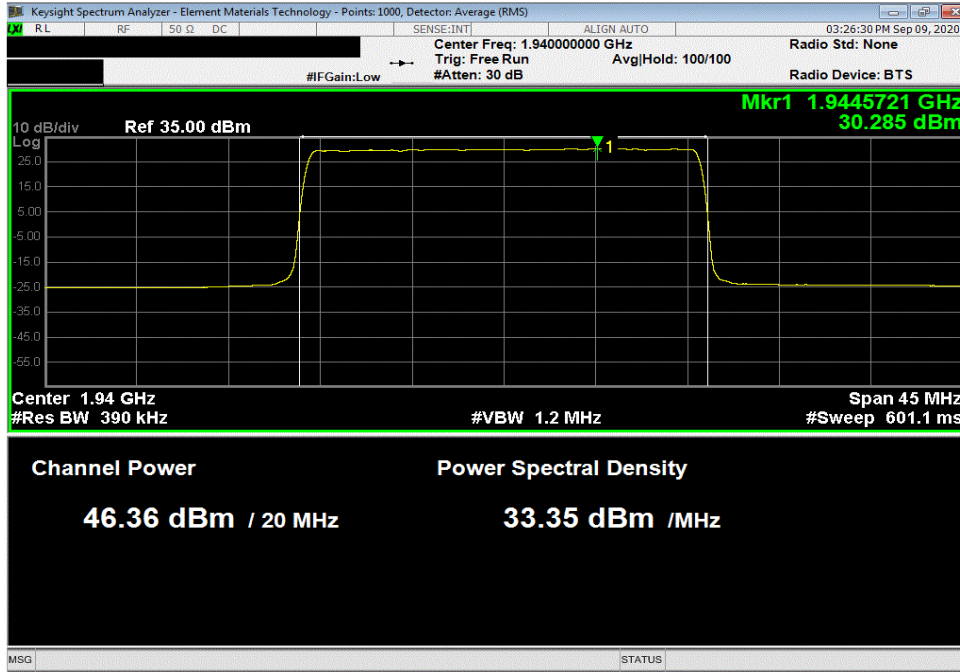


OUTPUT POWER

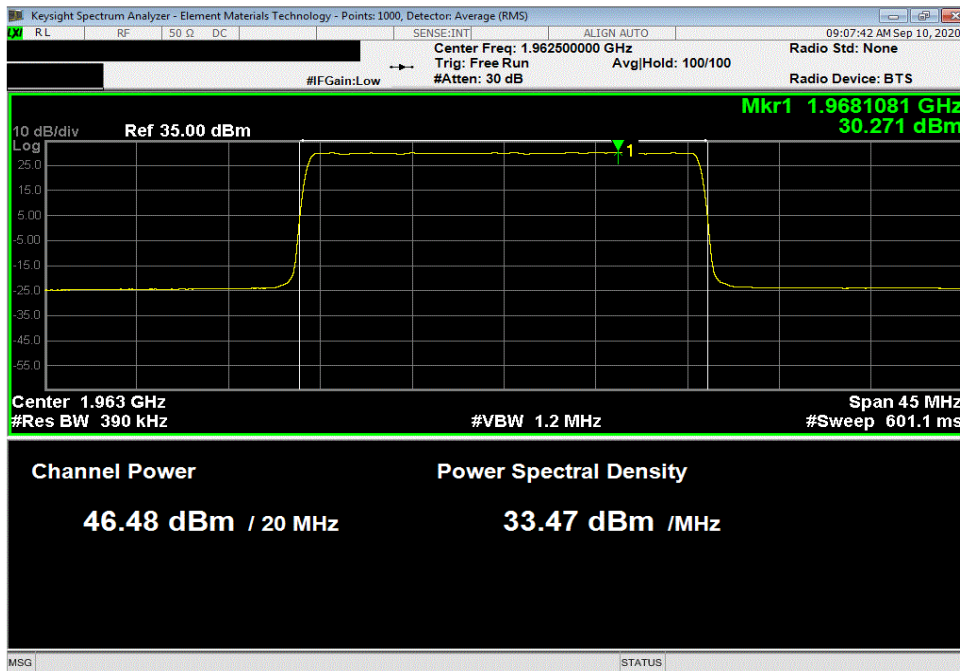


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 64-QAM Modulation, Low Channel, 1940 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.362	0	46.362	49.362	52.362	



Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.48	0	46.48	49.48	52.48	

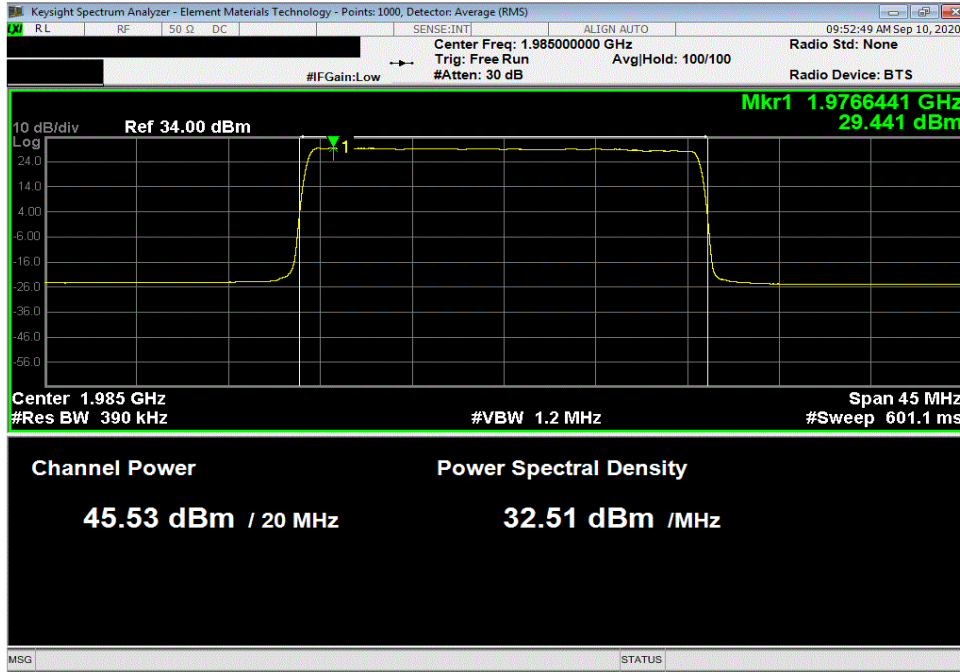


OUTPUT POWER

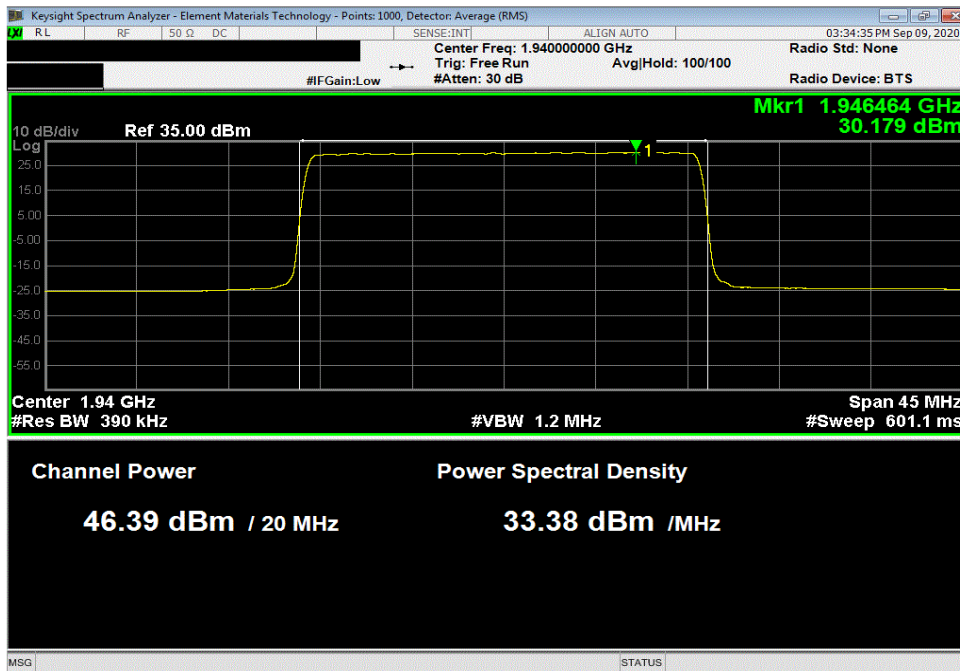


TMTx 2020.09.06.0 BETA XMM 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 64-QAM Modulation, High Channel, 1985 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.525	0	45.525	48.525	51.525	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 256-QAM Modulation, Low Channel, 1940 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.388	0	46.388	49.388	52.388	

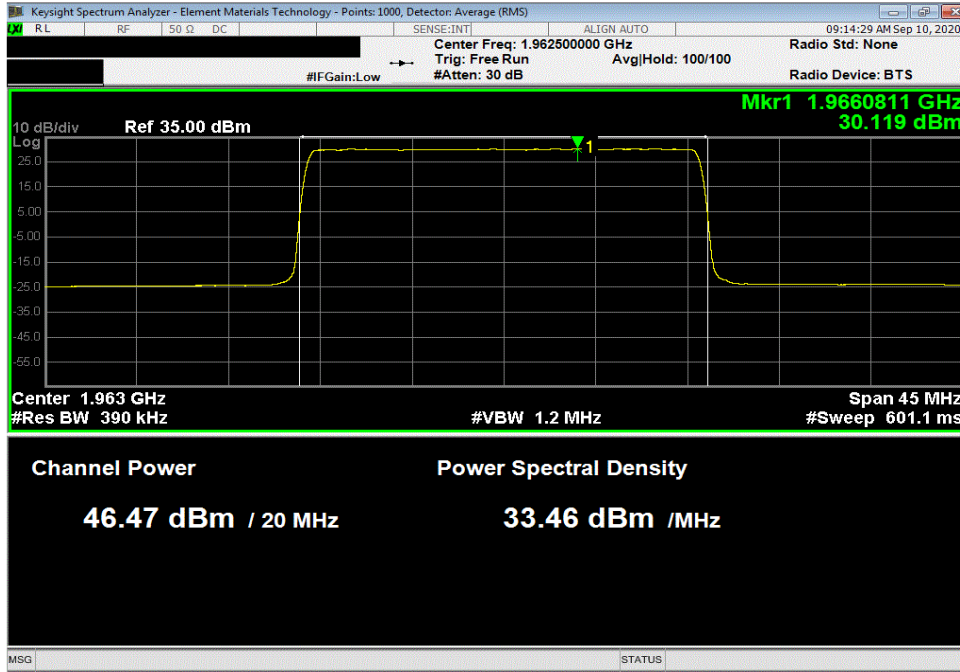


OUTPUT POWER

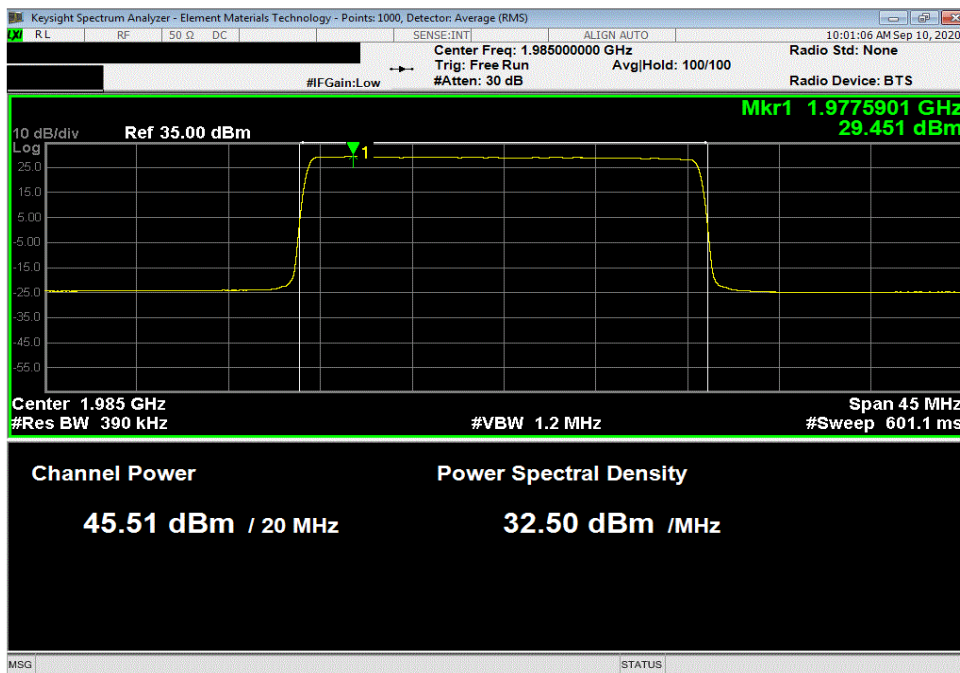


TN1Tx 2020.09.06.0 BETA XMI 2020.03.25.0

Band 25, 1930 MHz - 1995 MHz, 5G, 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/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.466	0	46.466	49.466	52.466	



Band 25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwidth, 256-QAM Modulation, High Channel, 1985 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
45.511	0	45.511	48.511	51.511	



OUTPUT POWER INNER CHANNELS

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	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21

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 (FHFB) as the original certification test. The FHFB 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 INNER CHANNELS



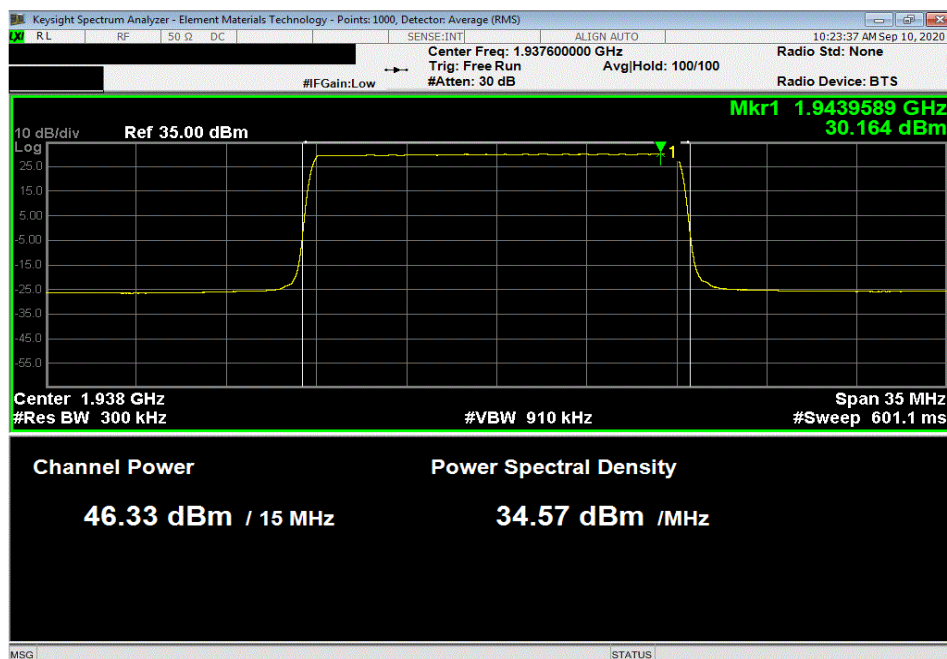
EUT: FHFB (FCC C2PC)		Work Order: NOKI0021	
Serial Number: L9144200604		Date: 10-Sep-20	
Customer: Nokia Solutions and Networks		Temperature: 22.6 °C	
Attendees: Mitchell Hill, John Rattanavong		Humidity: 49.1% RH	
Project: None		Barometric Pres.: 1024 mbar	
Tested by: Brandon Hobbs		Power: 54 VDC	
Job Site: TX05			
TEST SPECIFICATIONS		Test Method	
FCC 24E:2020		ANSI C63.26:2015	
RSS-133:2018		RSS-133:2018	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. The carrier power was set to maximum for all testing. The total output power for multiport (2x2 MIMO & 4x4 MIMO) operation was determined based upon ANSI 63.26 clauses 6.4.3.1 and 6.4.3.2.4 (10 Log Nout). The total output power for two port operation is single port power + 3dB [i.e. 10 Log (2)]. The total output power for four port operation is single port power +6dB [i.e. 10 Log (4)].			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature	
		Initial Value dBm/Carrier BW	Duty Cycle
		Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW
		Four Port (4x4 MIMO) dBm/Carrier BW	
Port 1, Band n25, 1930 MHz - 1995 MHz			
15 MHz Bandwidth			
QPSK Modulation			
	Low Channel +100kHz: 1937.6 MHz	46.331	0
	High Channel -100kHz: 1987.4 MHz	46.434	0
16-QAM Modulation			
	Low Channel +100kHz: 1937.6 MHz	46.189	0
	High Channel -100kHz: 1987.4 MHz	46.314	0
64-QAM Modulation			
	Low Channel +100kHz: 1937.6 MHz	46.285	0
	High Channel -100kHz: 1987.4 MHz	46.392	0
256-QAM Modulation			
	Low Channel +100kHz: 1937.6 MHz	46.252	0
	High Channel -100kHz: 1987.4 MHz	46.373	0

OUTPUT POWER INNER CHANNELS

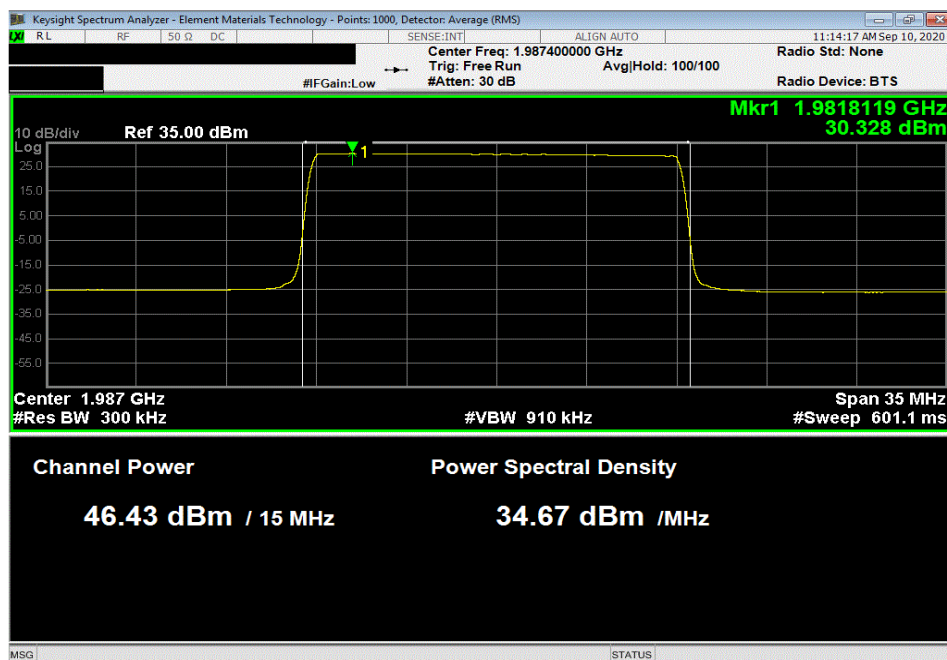


TXTx 2020.09.08.0 BETA XMI 2020.03.25.0

Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, QPSK Modulation, Low Channel +100kHz: 1937.6 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.331	0	46.331	49.331	52.331		



Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, QPSK Modulation, High Channel -100kHz: 1987.4 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.434	0	46.434	49.434	52.434		

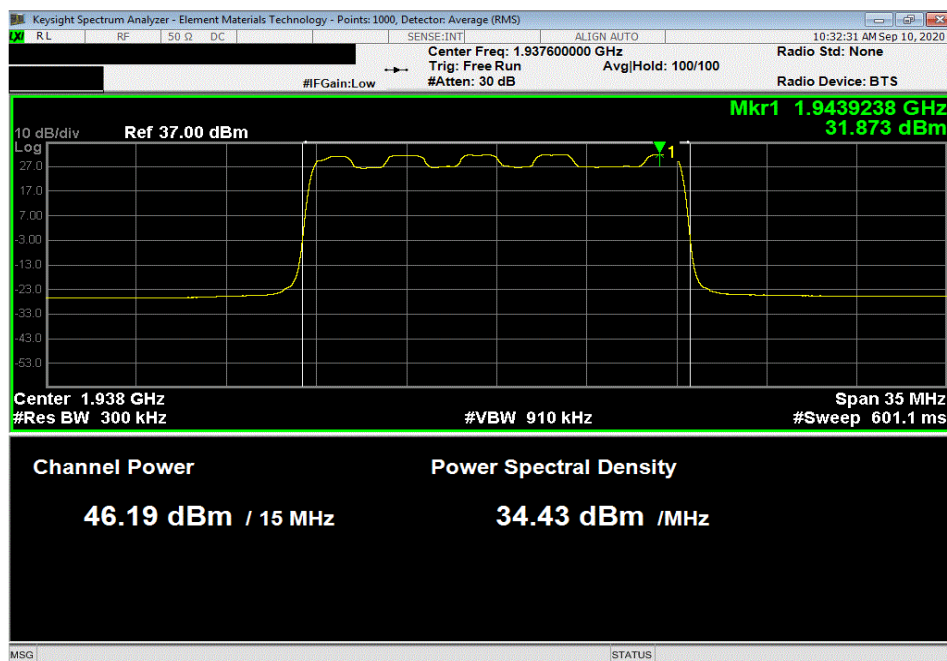


OUTPUT POWER INNER CHANNELS

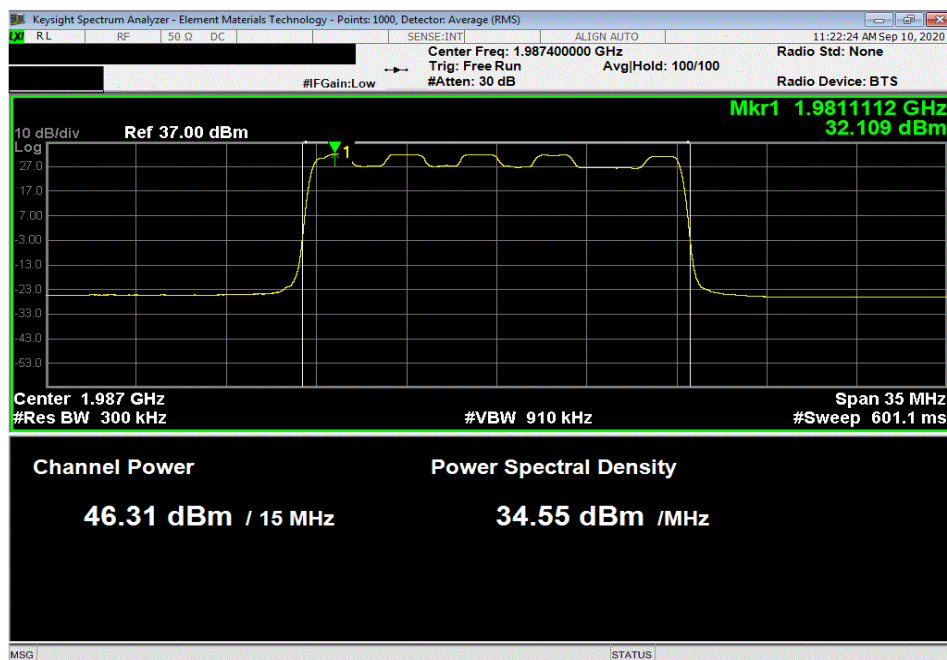


TXTx 2020.09.08.0 BETA XMI 2020.03.25.0

Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 16-QAM Modulation, Low Channel +100kHz: 1937.6 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.189	0	46.189	49.189	52.189	



Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 16-QAM Modulation, High Channel -100kHz: 1987.4 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
46.314	0	46.314	49.314	52.314	

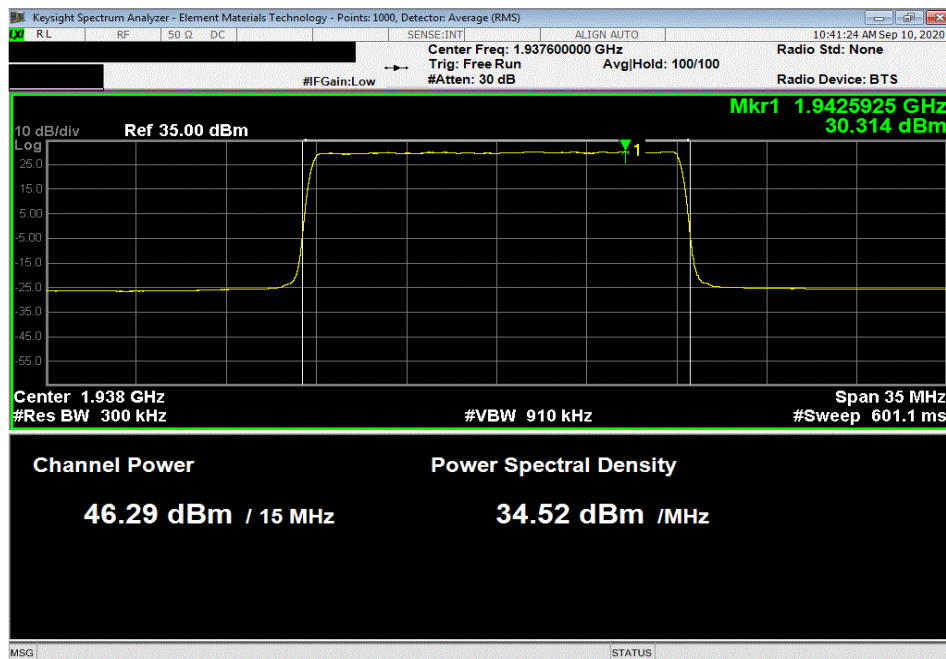


OUTPUT POWER INNER CHANNELS

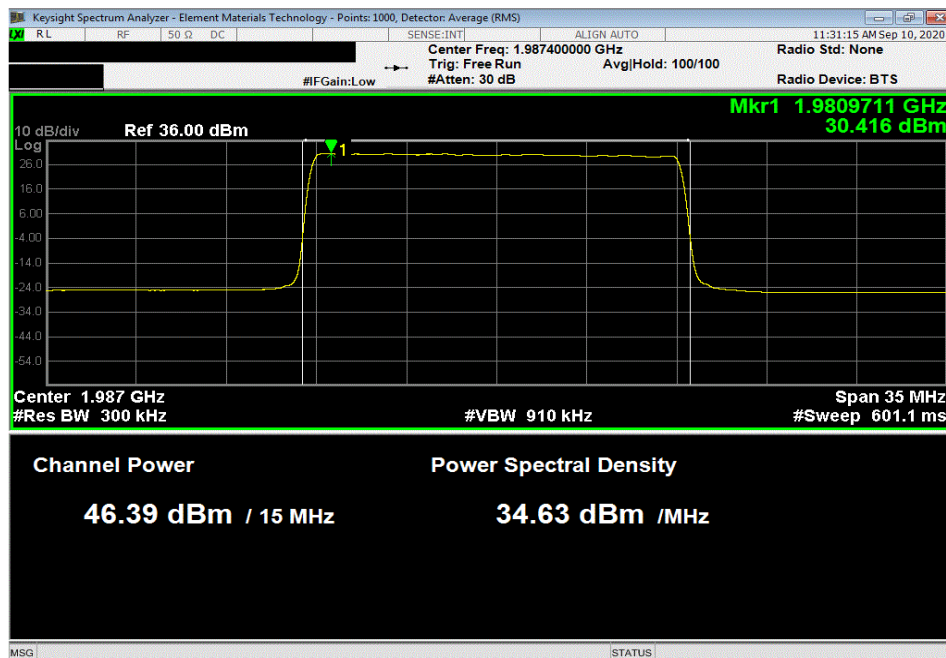


TXTx 2020.09.08.0 BETA XMI 2020.03.25.0

Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 64-QAM Modulation, Low Channel +100kHz: 1937.6 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.285	0	46.285	49.285	52.285		



Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 64-QAM Modulation, High Channel -100kHz: 1987.4 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.392	0	46.392	49.392	52.392		

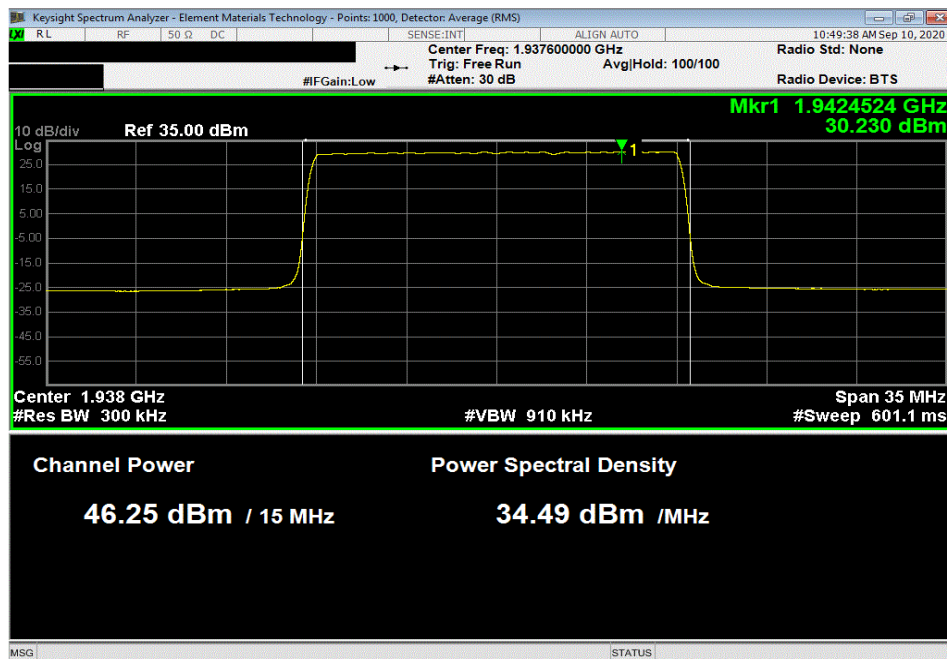


OUTPUT POWER INNER CHANNELS



TXTx 2020.09.08.0 BETA XMI 2020.03.25.0

Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 256-QAM Modulation, Low Channel +100kHz: 1937.6 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.252	0	46.252	49.252	52.252		



Port 1, Band n25, 1930 MHz - 1995 MHz, 15 MHz Bandwidth, 256-QAM Modulation, High Channel -100kHz: 1987.4 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/Carrier BW		dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
46.373	0	46.373	49.373	52.373		

