

AVERAGE POWER - BAND n12

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
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
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 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.

AHLBBA antenna ports 1&4 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.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 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

AVERAGE POWER - BAND n12



THFA 2022.06.03.0 XMI 2022.02.07.0

EUT: AHLBBA (C2PC/C3PC FCC/ISED)	Work Order: NOKI0047
Serial Number: K9193514835	Date: 30-Jul-22
Customer: Nokia of America Corporation	Temperature: 21.2 °C
Attendees: Mitchell Hill	Humidity: 63.5% RH
Project: None	Barometric Pres.: 1018 mbar
Tested by: Marty Martin	Power: 54VDC
TEST SPECIFICATIONS	Job Site: TX07
FCC 27:2022	Test Method
RSS-130 Issue 2: 2019	ANSI C63.26:2015
	ANSI C63.26:2015

COMMENTS
All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power. The total output power for multiport (2x2, 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. 10log(2)] and the total output power for a four port operation is single port power + 6dB [i.e. 10log(4)].

DEVIATIONS FROM TEST STANDARD
None

Configuration #	2	Signature	<i>Marty Martin</i>
-----------------	---	-----------	---------------------

	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW
--	--------------------------	---------------------------	-------------------------------	---------------------------------------	--

Port 1					
Band n12, 729 - 745 Mhz					
5 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 737.0 MHz	49.062	0	49.0	52.0	55.0
16QAM Modulation					
Mid Channel, 737.0 MHz	48.897	0	48.9	51.9	54.9
64QAM Modulation					
Mid Channel, 737.0 MHz	49.087	0	49.1	52.1	55.1
256QAM Modulation					
Low Channel, 731.5 MHz	49.097	0	49.1	52.1	55.1
Mid Channel, 737.0 MHz	49.111	0	49.1	52.1	55.1
High Channel, 742.5 MHz	49.076	0	49.1	52.1	55.1
10 MHz Bandwidth					
256QAM Modulation					
Low Channel, 734 MHz	49.069	0	49.1	52.1	55.1
Mid Channel, 737.0 MHz	49.066	0	49.1	52.1	55.1
High Channel, 740 MHz	48.975	0	49.0	52.0	55.0
15 MHz Bandwidth					
256QAM Modulation					
Low Channel, 736.5 MHz	49.052	0	49.1	52.1	55.1
Mid Channel, 737.0 MHz	49.02	0	49.0	52.0	55.0
High Channel, 737.5 MHz	49.023	0	49.0	52.0	55.0

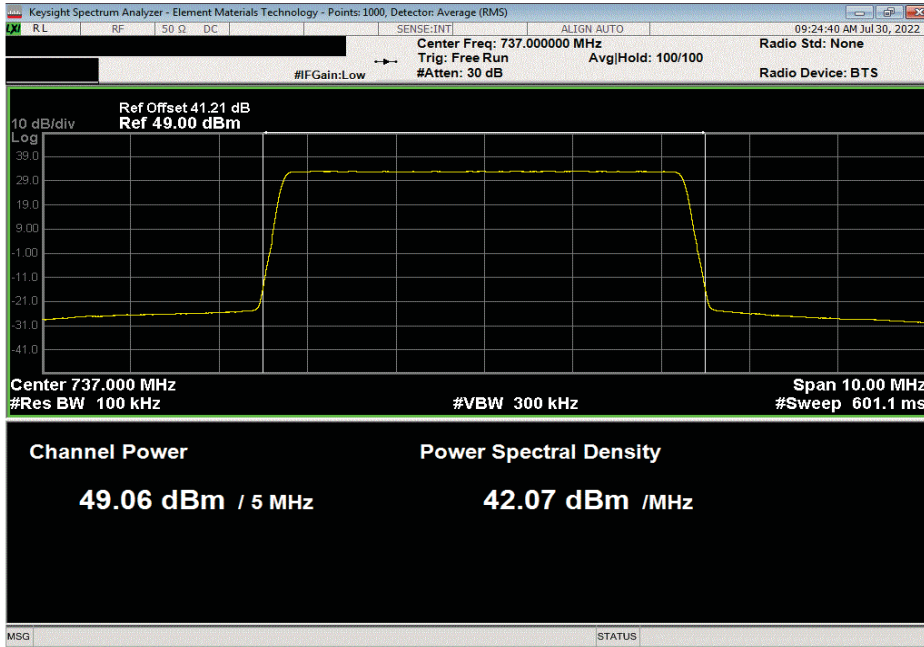
Port 2					
Band n12, 729 - 745 Mhz					
5 MHz Bandwidth					
QPSK Modulation					
Mid Channel, 737.0 MHz	49.041	0	49.0	52.0	55.0
16QAM Modulation					
Mid Channel, 737.0 MHz	48.817	0	48.8	51.8	54.8
64QAM Modulation					
Mid Channel, 737.0 MHz	49.019	0	49.0	52.0	55.0
256QAM Modulation					
Low Channel, 731.5 MHz	49.003	0	49.0	52.0	55.0
Mid Channel, 737.0 MHz	48.965	0	49.0	52.0	55.0
High Channel, 742.5 MHz	48.994	0	49.0	52.0	55.0
10 MHz Bandwidth					
256QAM Modulation					
Low Channel, 734 MHz	48.933	0	48.9	51.8	54.8
Mid Channel, 737.0 MHz	48.963	0	49.0	52.0	55.0
High Channel, 740 MHz	48.916	0	48.9	51.9	54.9
15 MHz Bandwidth					
256QAM Modulation					
Low Channel, 736.5 MHz	48.882	0	48.9	51.9	54.9
Mid Channel, 737.0 MHz	48.848	0	48.8	51.8	54.8
High Channel, 737.5 MHz	48.912	0	48.9	51.9	54.9

AVERAGE POWER - BAND n12

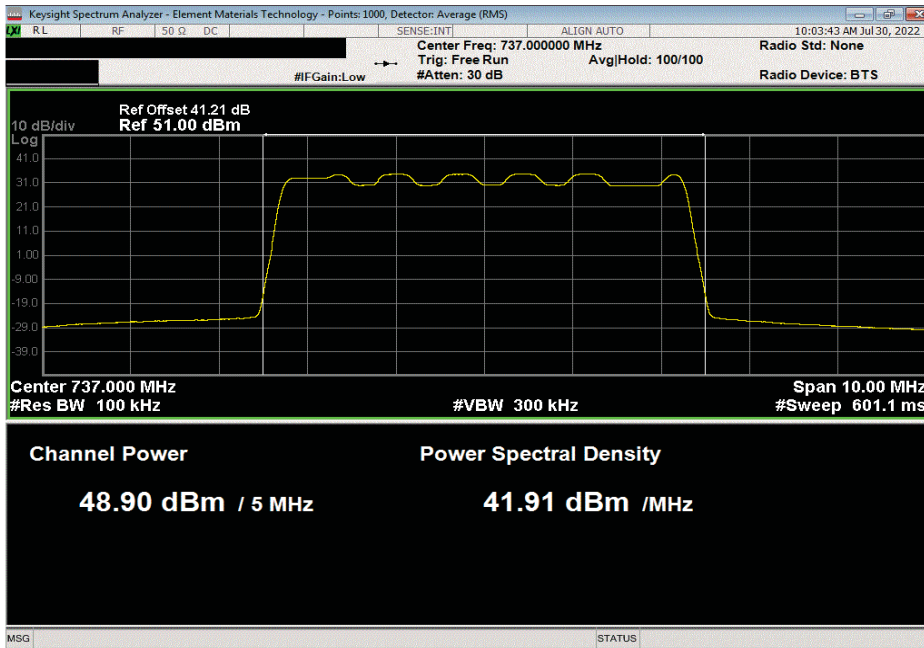


ThTx 2022.06.03.0 XMN 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.062	0	49.1	52.1	55.1		



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.897	0	48.9	51.9	54.9		

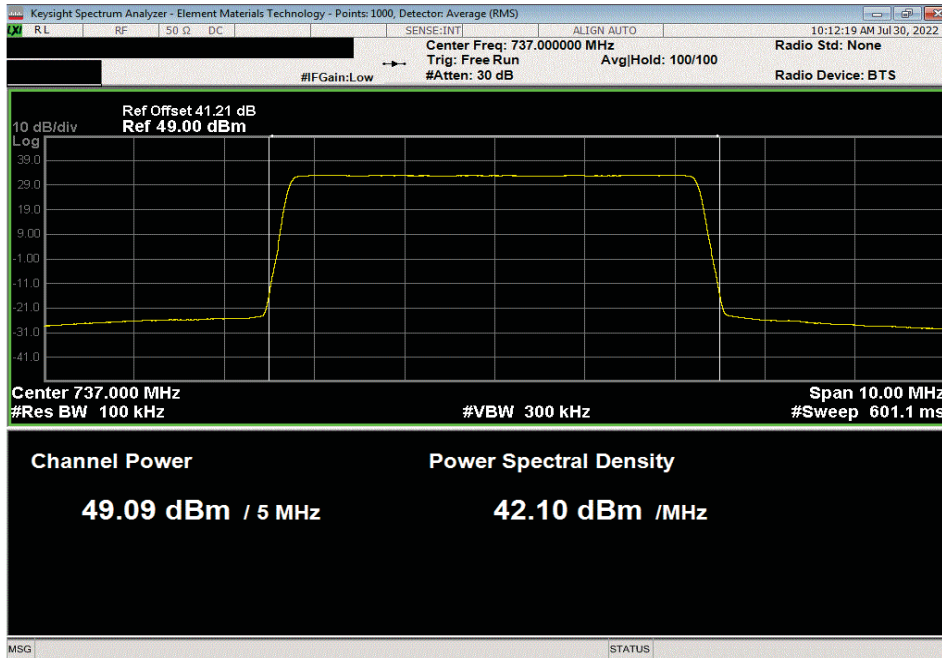


AVERAGE POWER - BAND n12

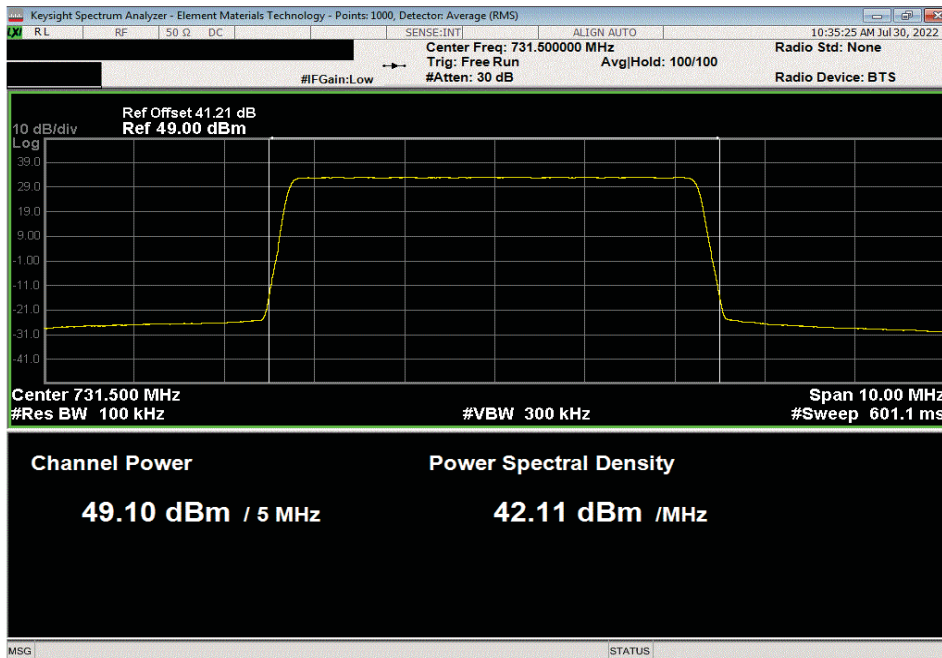


ThxTx 2022.06.03.0 XMI 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.087	0	49.1	52.1	55.1		



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.097	0	49.1	52.1	55.1		

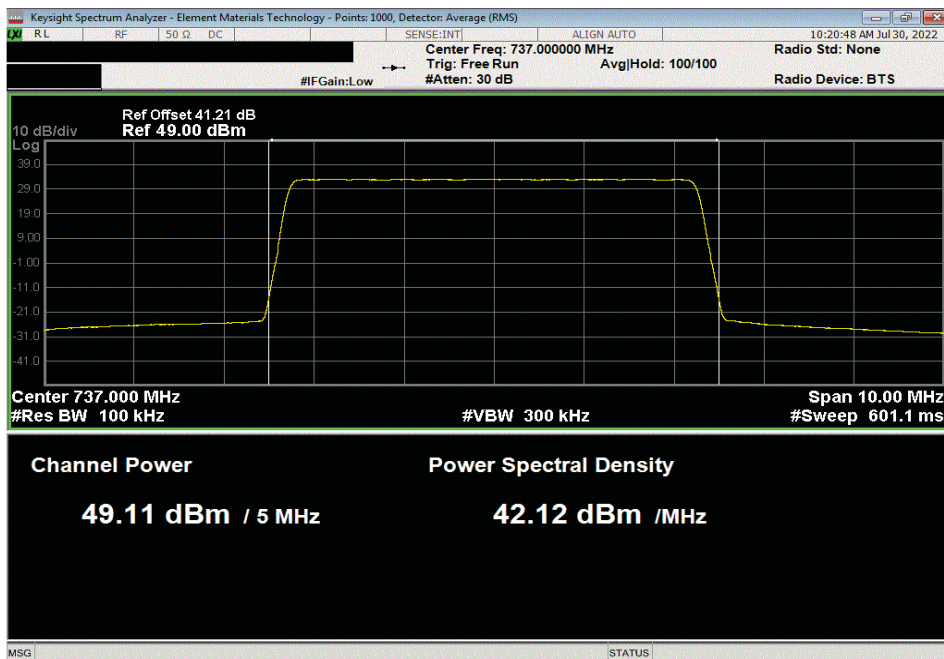


AVERAGE POWER - BAND n12

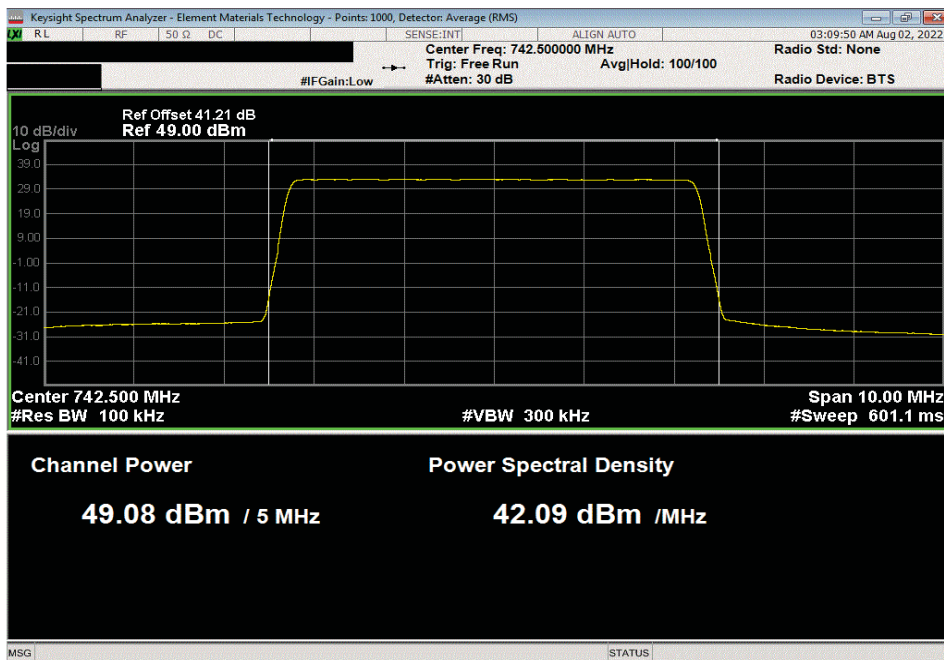


TbT's 2022.06.03.0 XMN 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.111	0	49.1	52.1	55.1		



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.076	0	49.1	52.1	55.1		

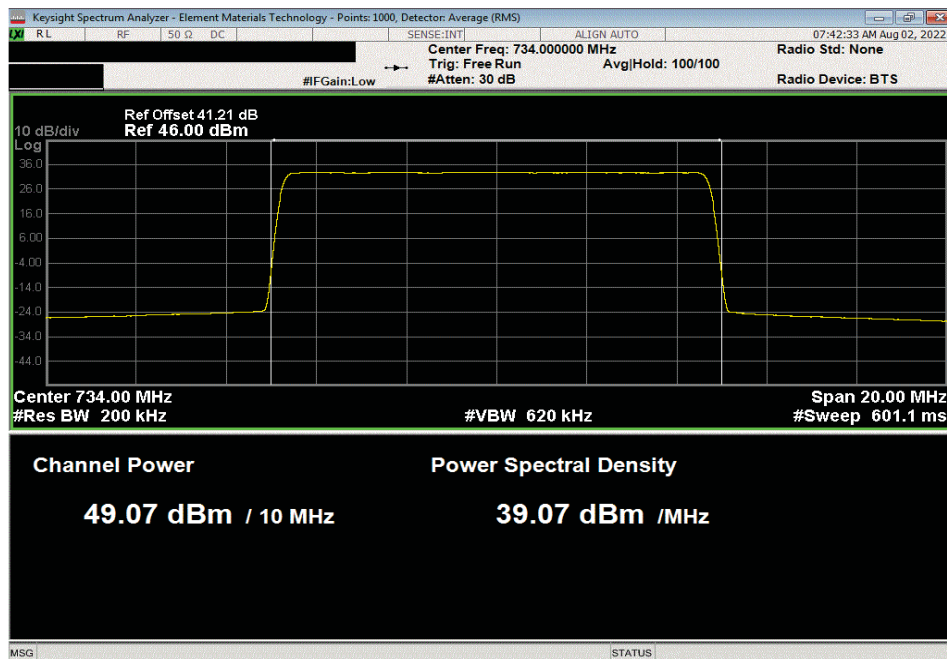


AVERAGE POWER - BAND n12

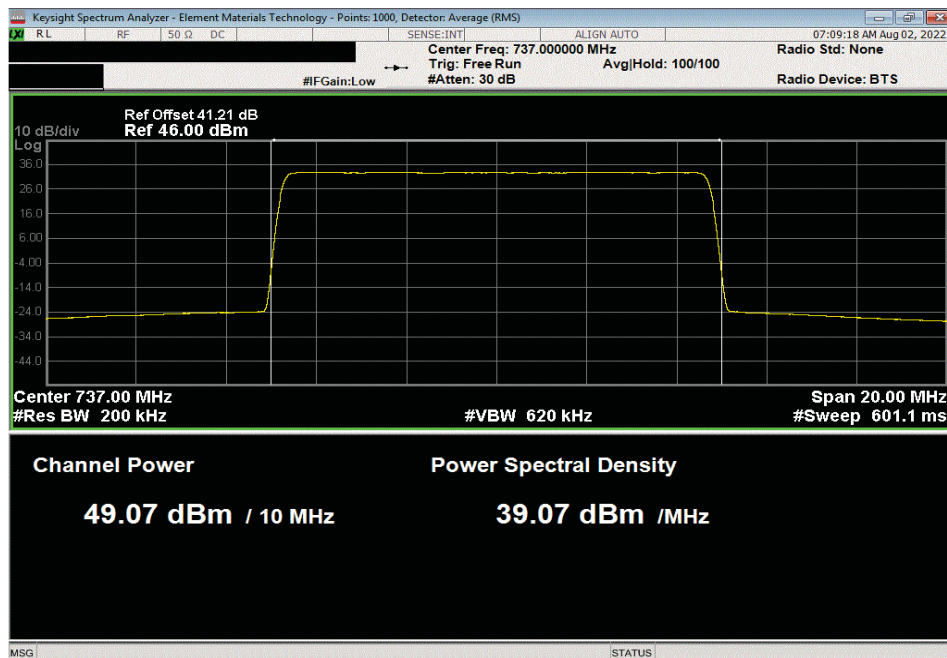


TbITx 2022.06.03.0 XMI 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.069	0	49.1	52.1	55.1		



Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.066	0	49.1	52.1	55.1		

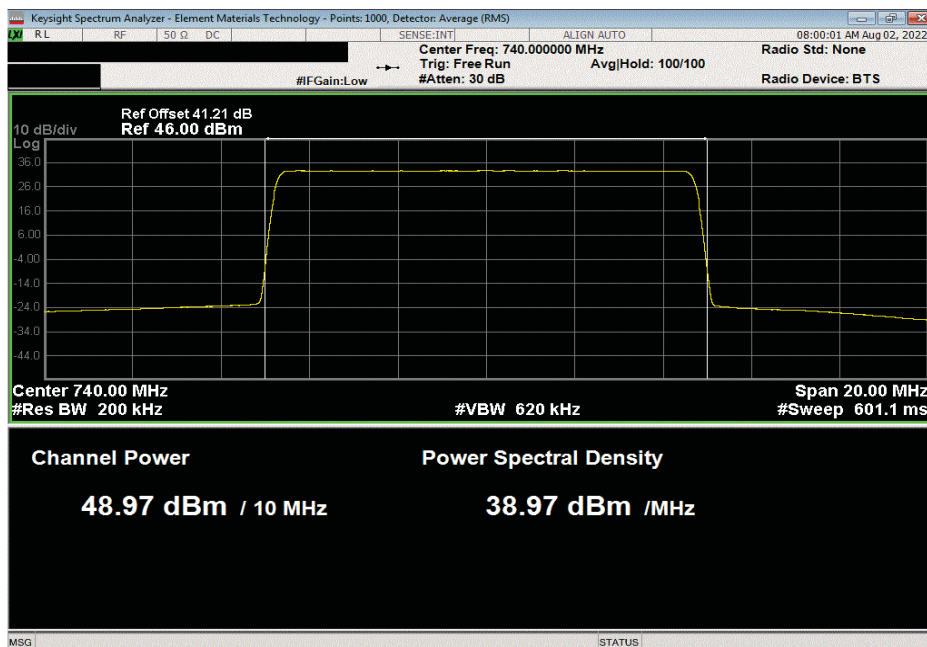


AVERAGE POWER - BAND n12

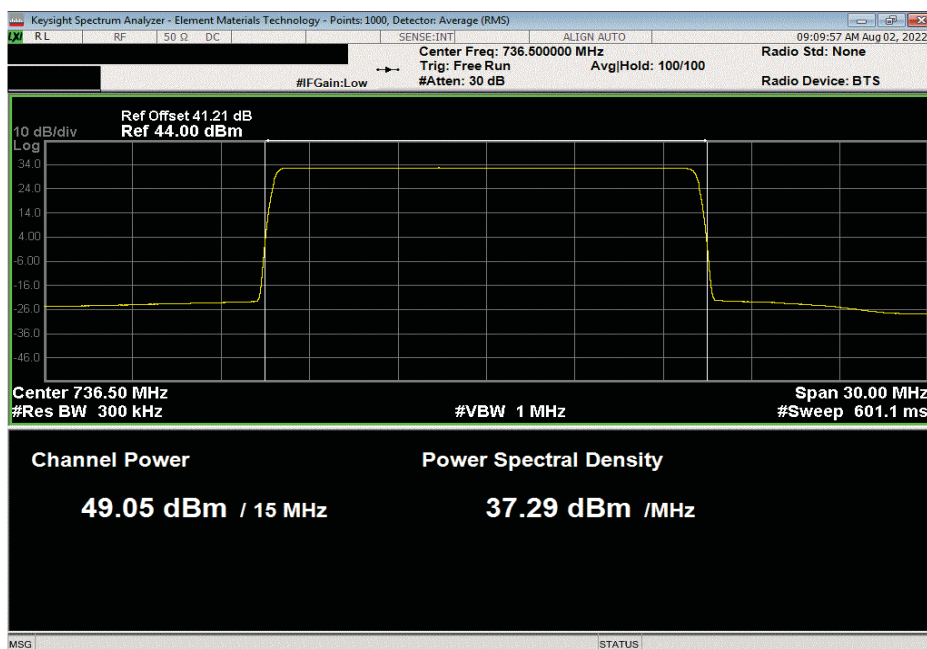


ThxTv 2022.06.03.0 XMM 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.975	0	49	52	55		



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.052	0	49.1	52.1	55.1		

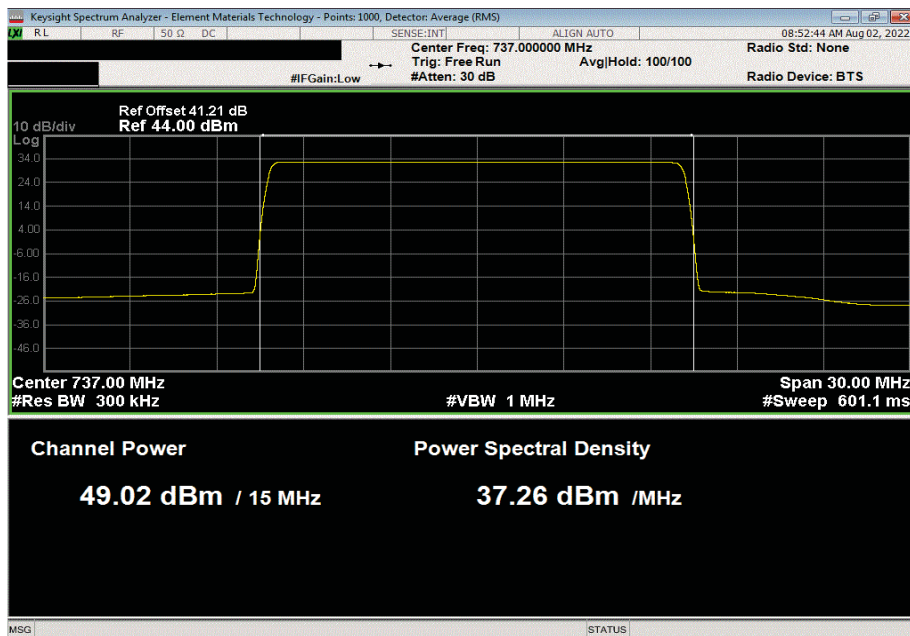


AVERAGE POWER - BAND n12

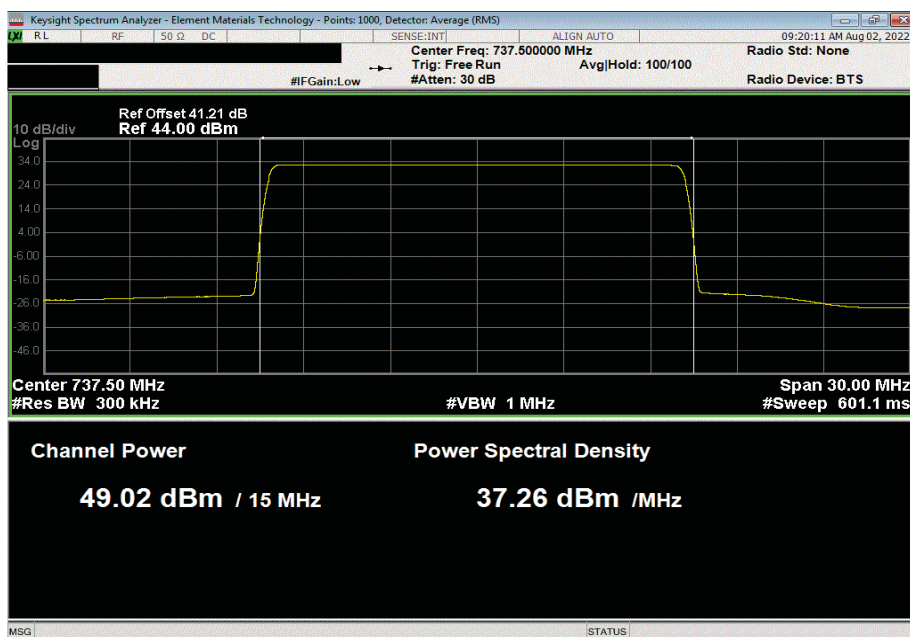


ThTx 2022.06.03.0 XMH 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	49.02	0	49	52	55	



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
	Initial Value dBm/MHz	Duty Cycle Factor (dB)	Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW	Four Port (4x4 MIMO) dBm/Carrier BW	
	49.023	0	49	52	55	

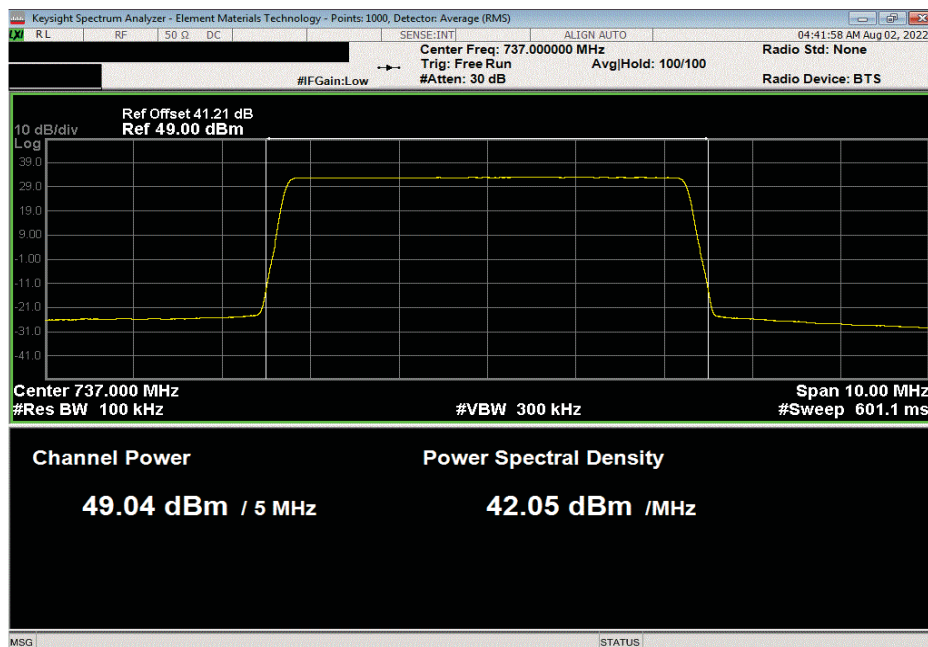


AVERAGE POWER - BAND n12

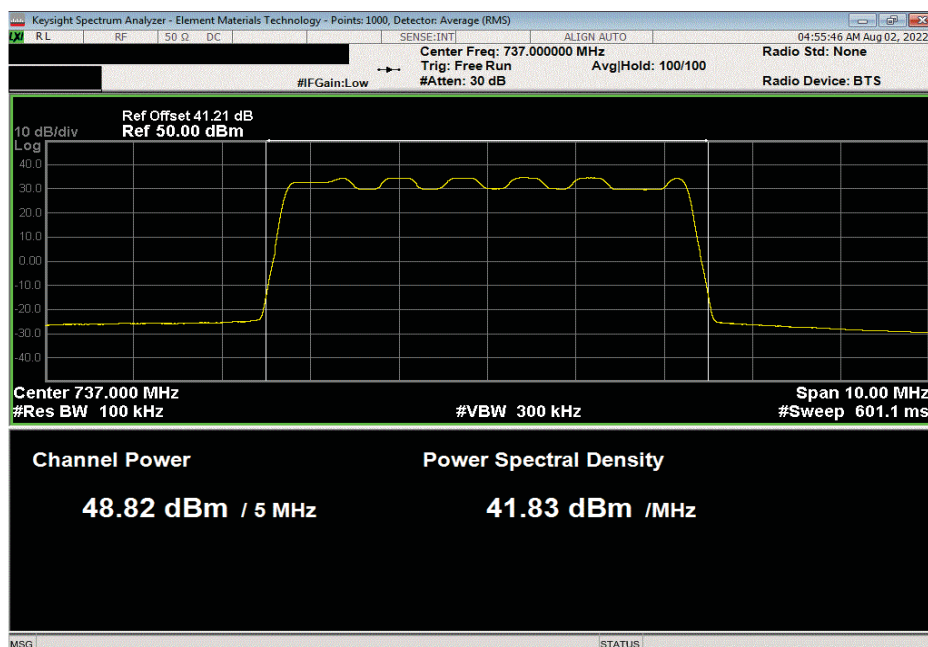


TbTb 2022 06 02 0 XMI 2022 02 07 0

Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.041	0	49	52	55		



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.817	0	48.8	51.8	54.8		

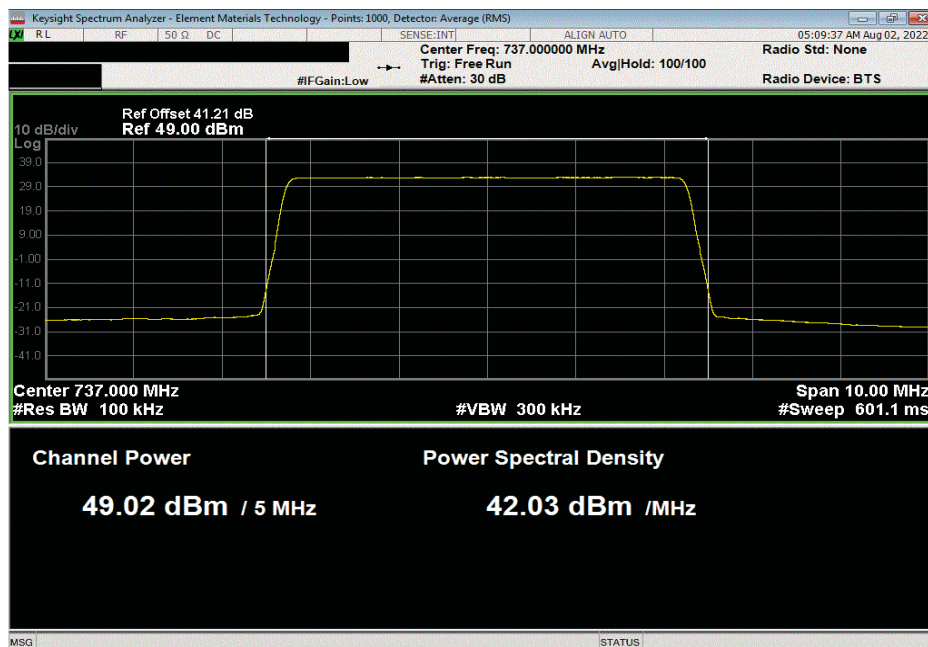


AVERAGE POWER - BAND n12

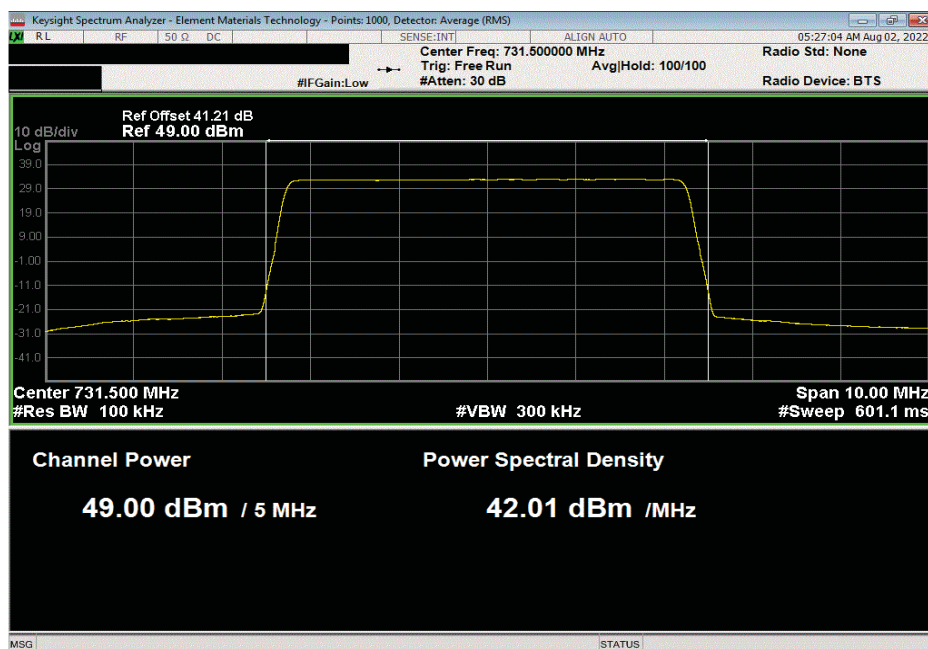


TbTt 2022 05 02 0 XMt 2022 02 07 0

Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.019	0	49	52	55		



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.003	0	49	52	55		

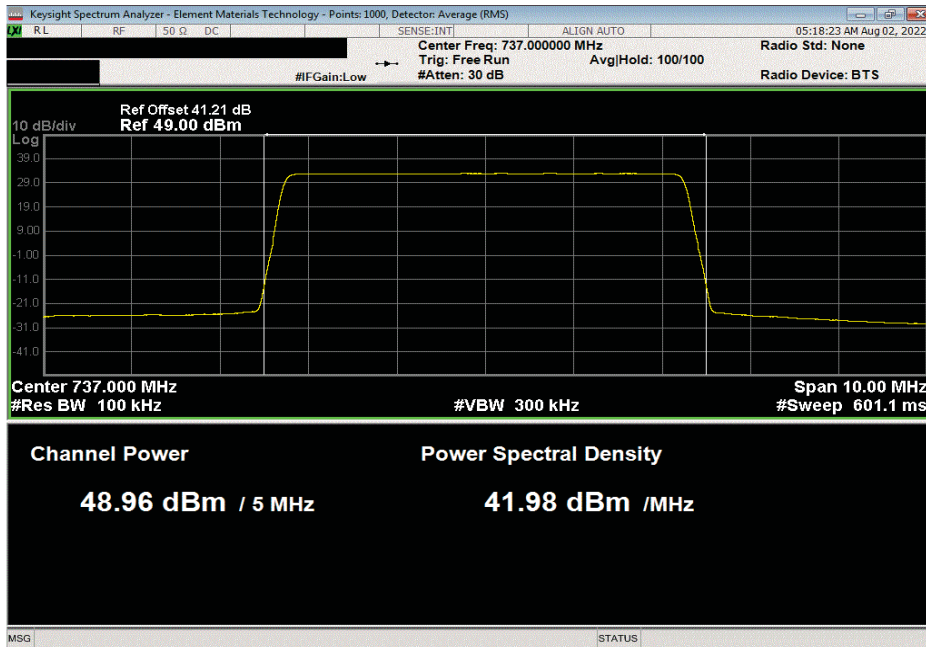


AVERAGE POWER - BAND n12

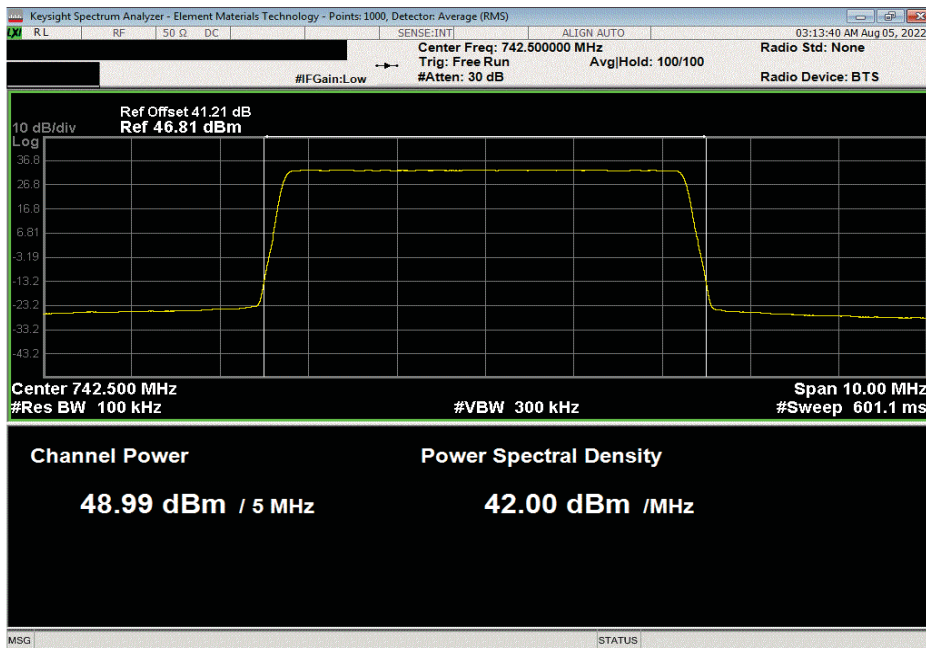


TbTx 2022 06 02 0 XMN 2022 02 07 0

Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.965	0	49	52	55		



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.994	0	49	52	55		

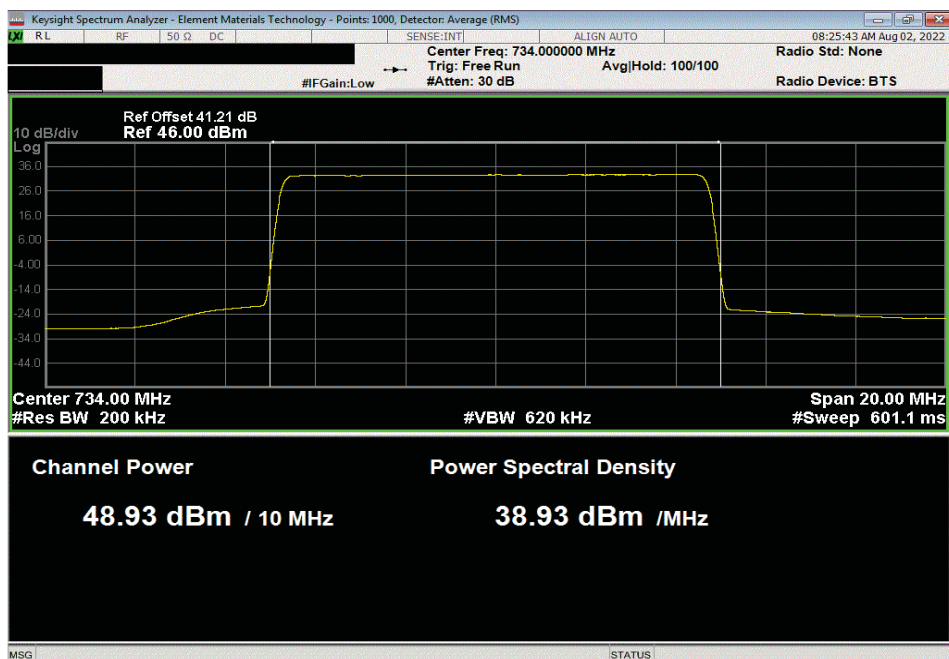


AVERAGE POWER - BAND n12

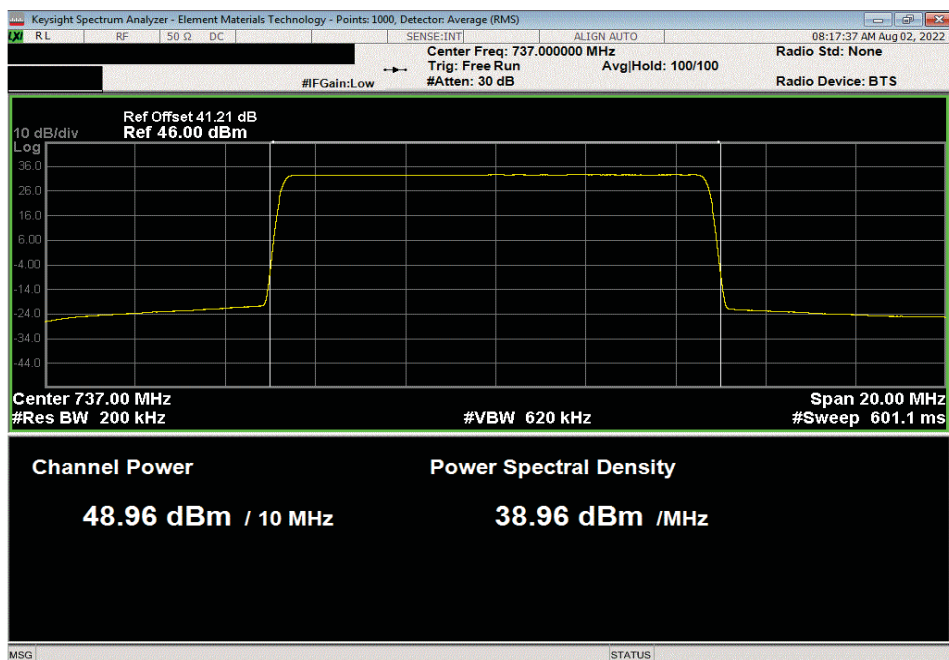


TbTb 2022.05.02.0 XMI 2022.02.07.0

Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.933	0	48.9	51.8	54.8		



Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.963	0	49	52	55		

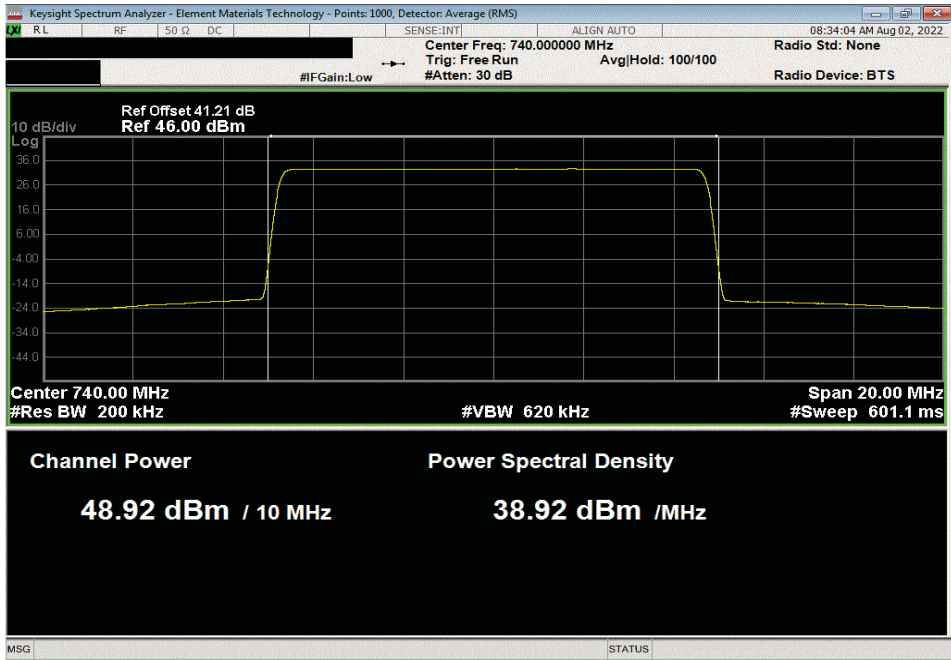


AVERAGE POWER - BAND n12

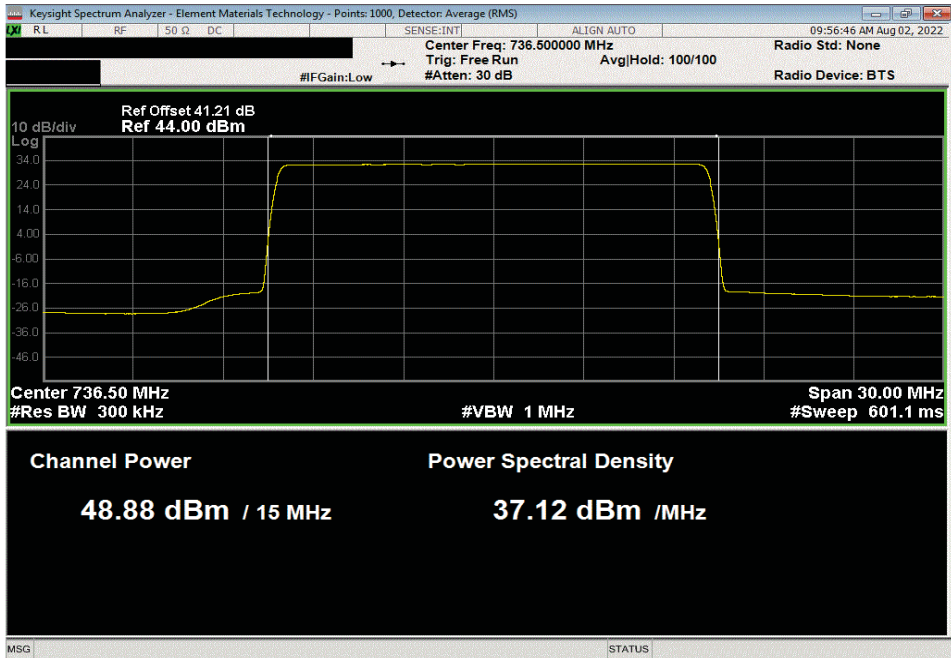


TMTx 2022.05.02.0 XMM 2022.02.07.0

Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.916	0	48.9	51.9	54.9		



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.882	0	48.9	51.9	54.9		

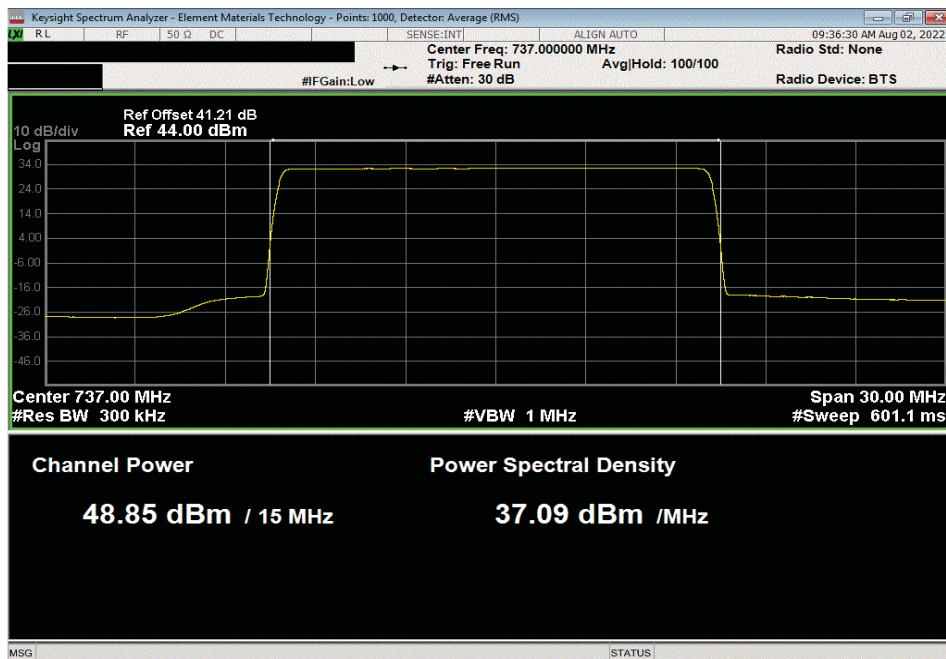


AVERAGE POWER - BAND n12

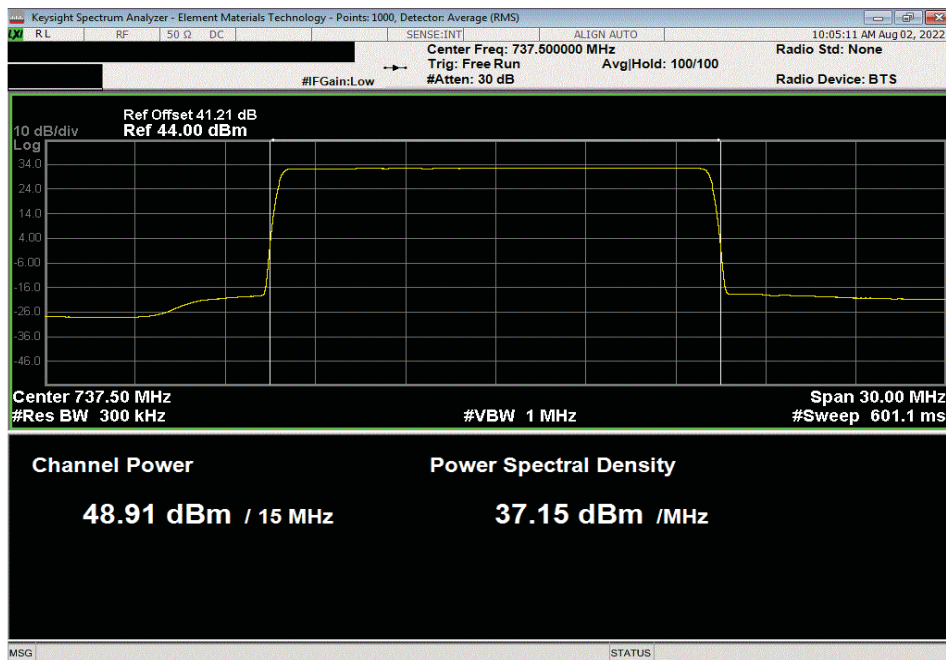


TMTx 2022.05.02.0 XMI 2022.02.07.0

Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.848	0	48.8	51.8	54.8		



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	Results	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.912	0	48.9	51.9	54.9		



AVERAGE POWER - BAND n14

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
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
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 measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

AHLBBA antenna ports 1&4 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.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 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

AVERAGE POWER - BAND n14



THTx 2022.05.02.0 XMM 2022.02.07.0

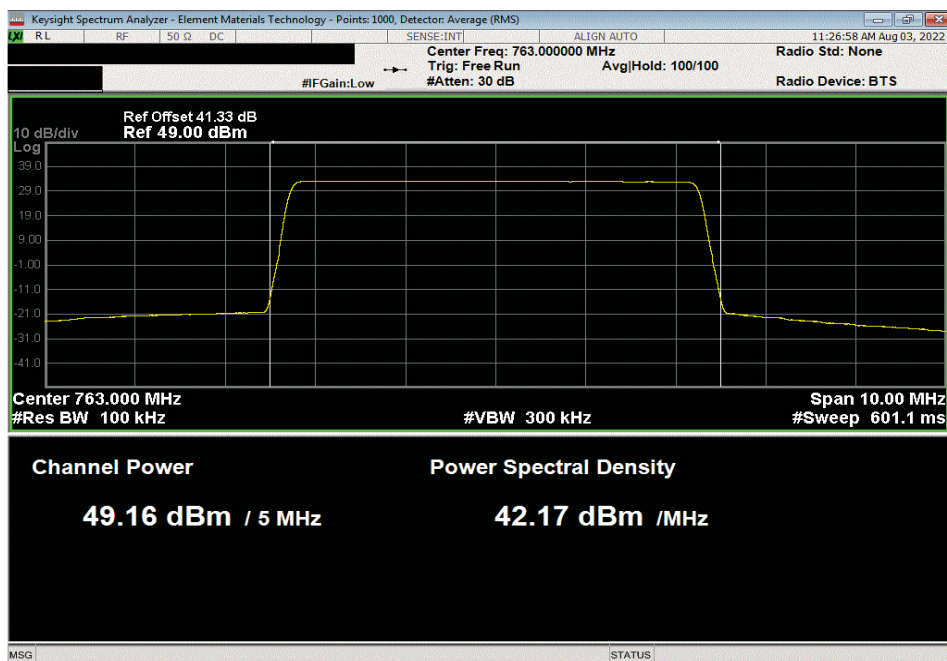
EUT: AHLBBA (C2PC/C3PC FCC/ISED)		Work Order: NOKI0047	
Serial Number: K9193514835		Date: 4-Aug-22	
Customer: Nokia Solutions and Networks		Temperature: 21.8 °C	
Attendees: Mitchell Hill		Humidity: 52.9% RH	
Project: None		Barometric Pres.: 1018 mbar	
Tested by: Marty Martin		Job Site: TX07	
Power: 54VDC			
TEST SPECIFICATIONS			
		Test Method	
RSS 140 Issue 1: 2018		ANSI C63.26:2015	
FCC 90R:2022		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power. The total output power for multiport (2x2, 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. 10log(2)] and the total output power for a four port operation is single port power + 6dB [i.e. 10log(4)].			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Marty Martin</i>	
		Initial Value dBm/MHz	Duty Cycle Factor (dB)
		Single Port dBm/Carrier BW	Two Port (2x2 MIMO) dBm/Carrier BW
			Four Port (4x4 MIMO) dBm/Carrier BW
Port 1			
Band n14, 758 - 768 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
	Mid Channel, 763 MHz	49.157	0
		49.2	52.2
			55.2
16QAM Modulation			
	Mid Channel, 763 MHz	48.931	0
		48.9	51.9
			54.9
64QAM Modulation			
	Mid Channel, 763 MHz	49.225	0
		49.2	52.2
			55.2
256QAM Modulation			
	Mid Channel, 763 MHz	49.200	0
		49.2	52.2
			55.2
	High Channel, 765.5 MHz	48.993	0
		49.0	52.0
			55.0
10 MHz Bandwidth			
256QAM Modulation			
	Mid Channel, 763 MHz	48.904	0
		48.9	51.9
			54.9
Port 2			
Band n14, 758 - 768 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
	Mid Channel, 763 MHz	49.035	0
		49.0	52.0
			55.0
16QAM Modulation			
	Mid Channel, 763 MHz	48.827	0
		48.8	51.8
			54.8
64QAM Modulation			
	Mid Channel, 763 MHz	49.020	0
		49.0	52.0
			55.0
256QAM Modulation			
	Low Channel, 760.5 MHz	49.016	0
		49.0	52.0
			55.0
	Mid Channel, 763 MHz	48.996	0
		49.0	52.0
			55.0
	High Channel, 765.5 MHz	48.910	0
		48.9	51.9
			54.9
10 MHz Bandwidth			
256QAM Modulation			
	Mid Channel, 763 MHz	48.937	0
		48.9	51.9
			54.9

AVERAGE POWER - BAND n14

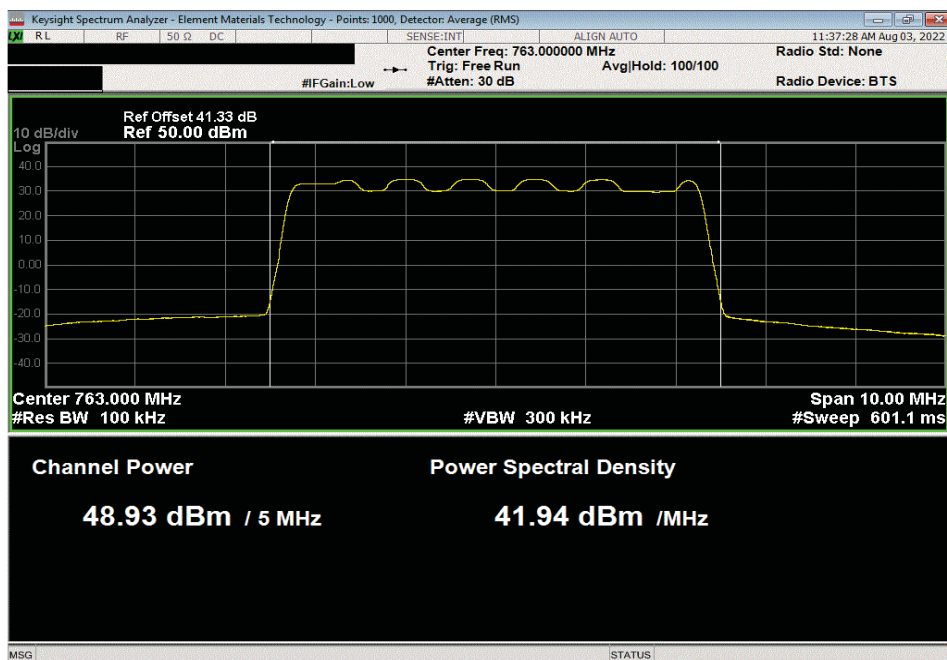


TMTx 2022.06.02.0 XMI 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.157	0	49.2	52.2	55.2		



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.931	0	48.9	51.9	54.9		

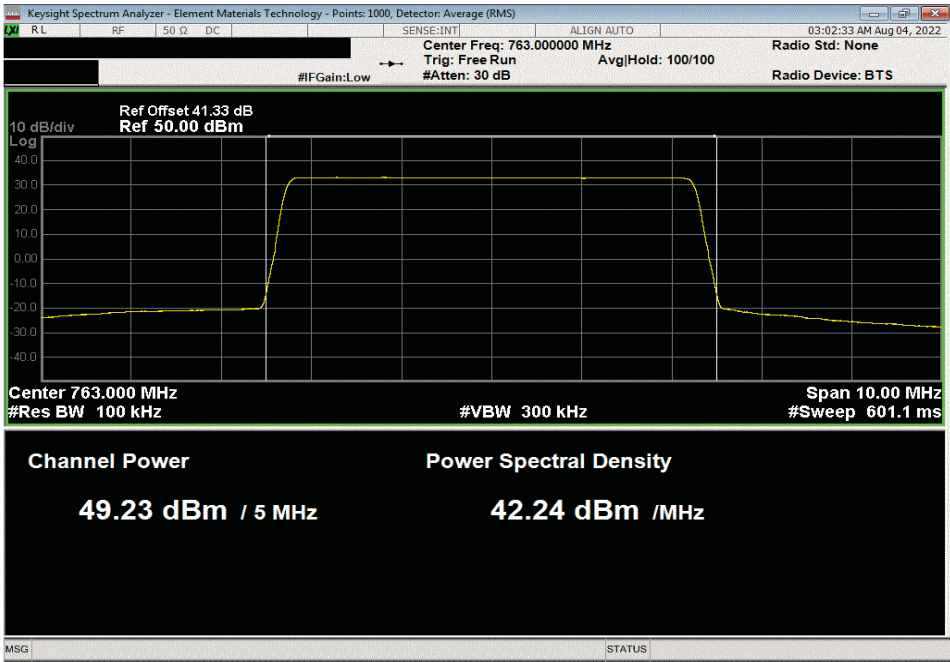


AVERAGE POWER - BAND n14



TMTx 2022.05.02.0 XMI 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz					
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
49.225	0	49.2	52.2	55.2	

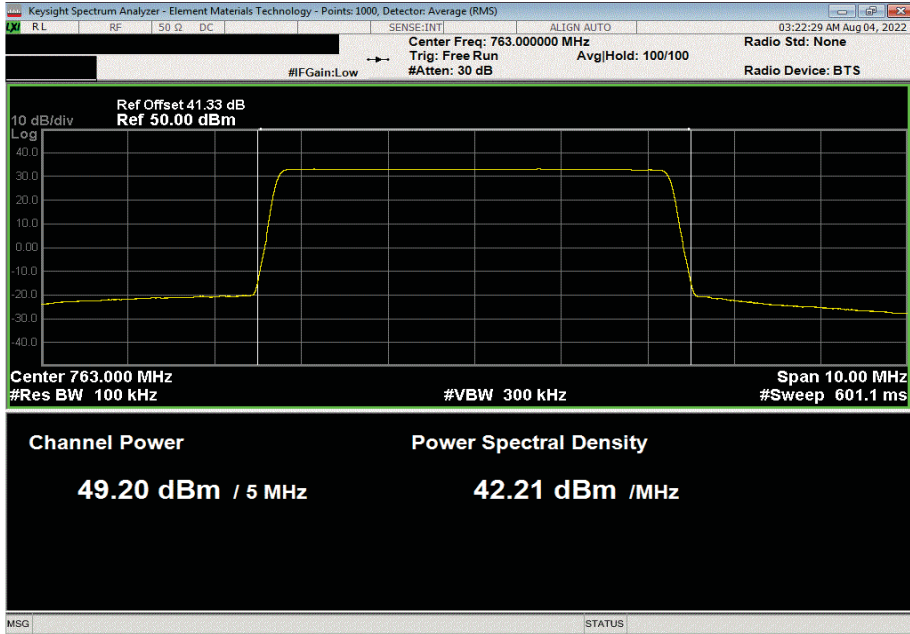


AVERAGE POWER - BAND n14

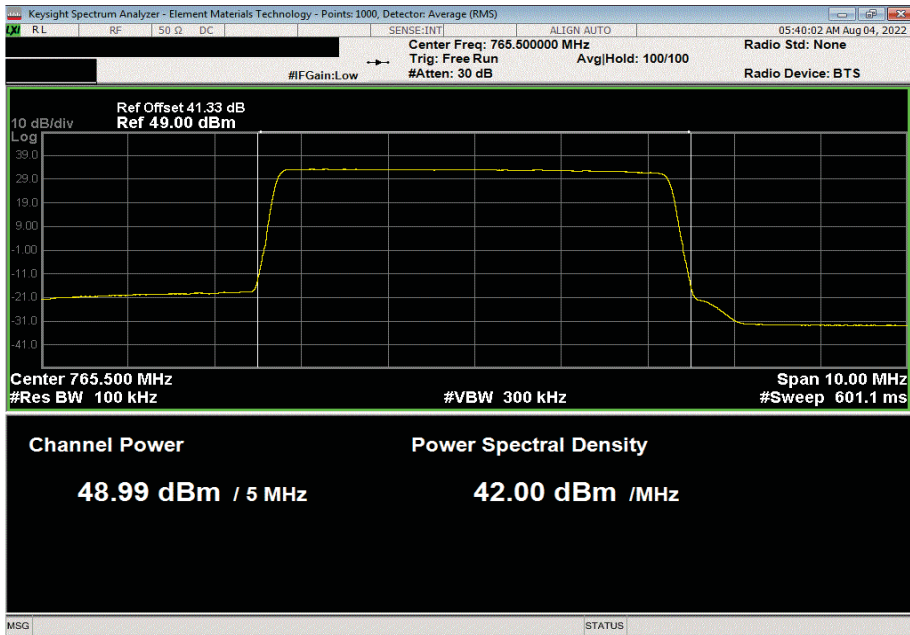


Thx 2022.06.02.0 XMM 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
	49.2	0	49.2	52.2	55.2	



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
	Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)	
	dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW	
	48.993	0	49	52	55	

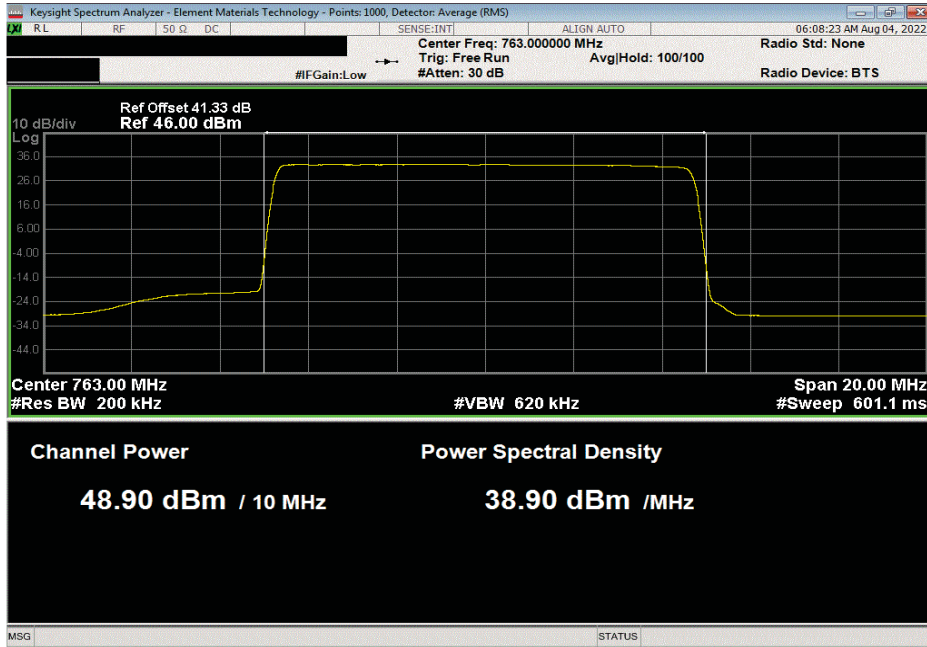


AVERAGE POWER - BAND n14



ThtTx 2022.05.02.0 XMM 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.904	0	48.9	51.9	54.9		

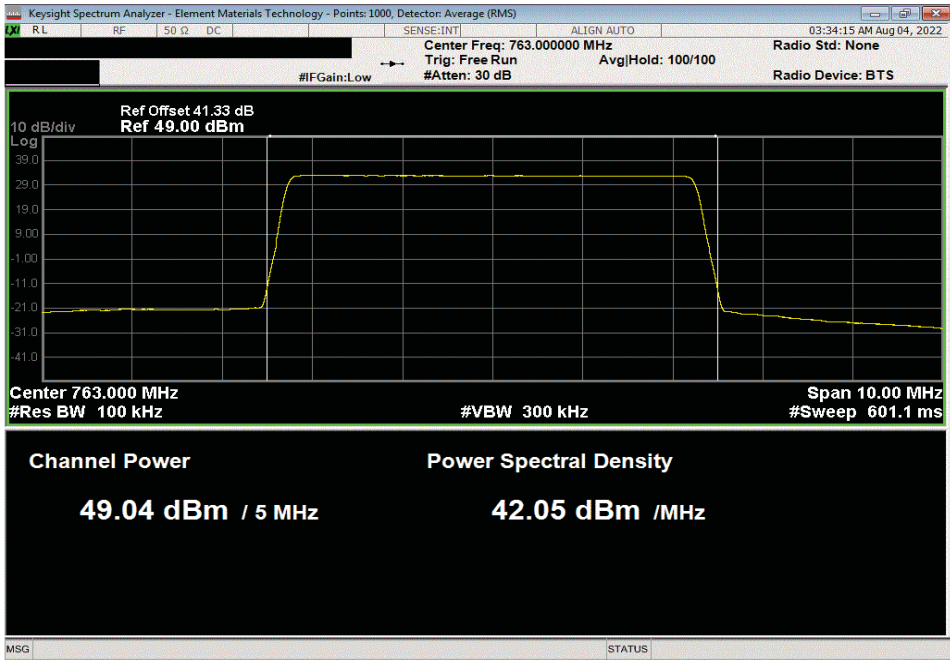


AVERAGE POWER - BAND n14

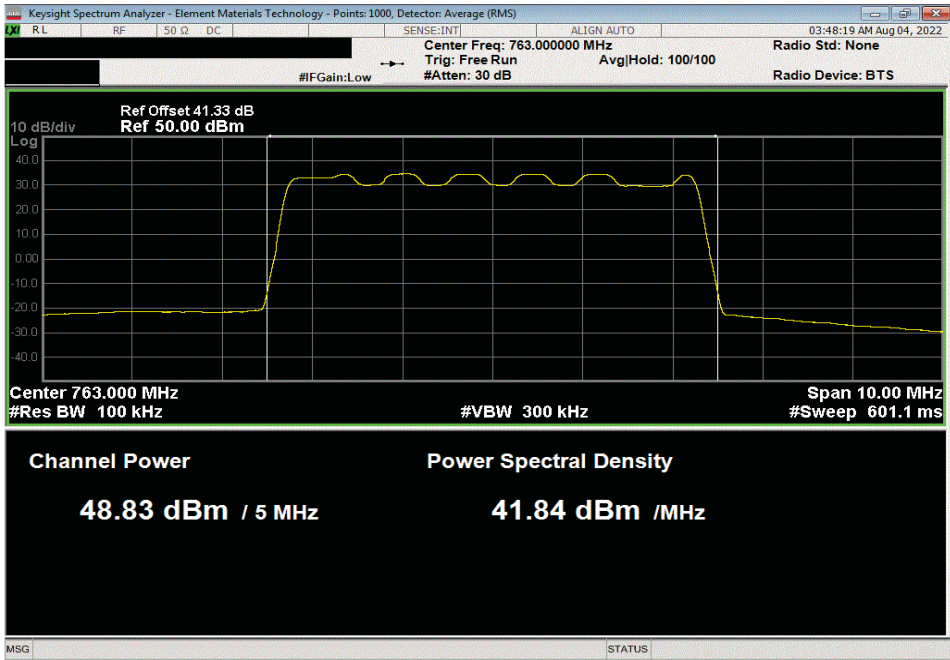


TbTtx 2022.05.02.0 XMM 2022.02.07.0

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.035	0	49	52	55		



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.827	0	48.8	51.8	54.8		

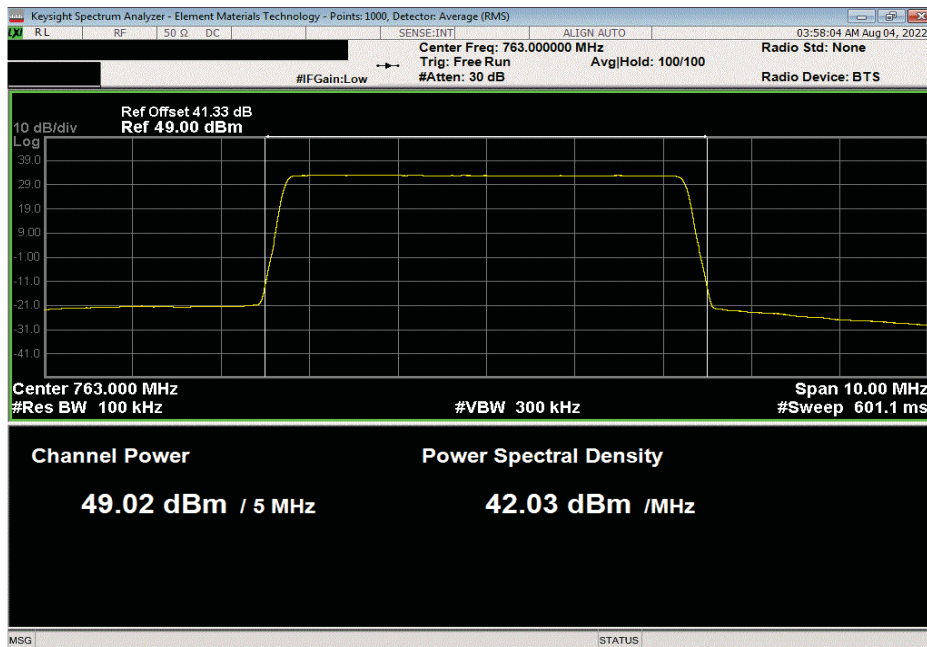


AVERAGE POWER - BAND n14

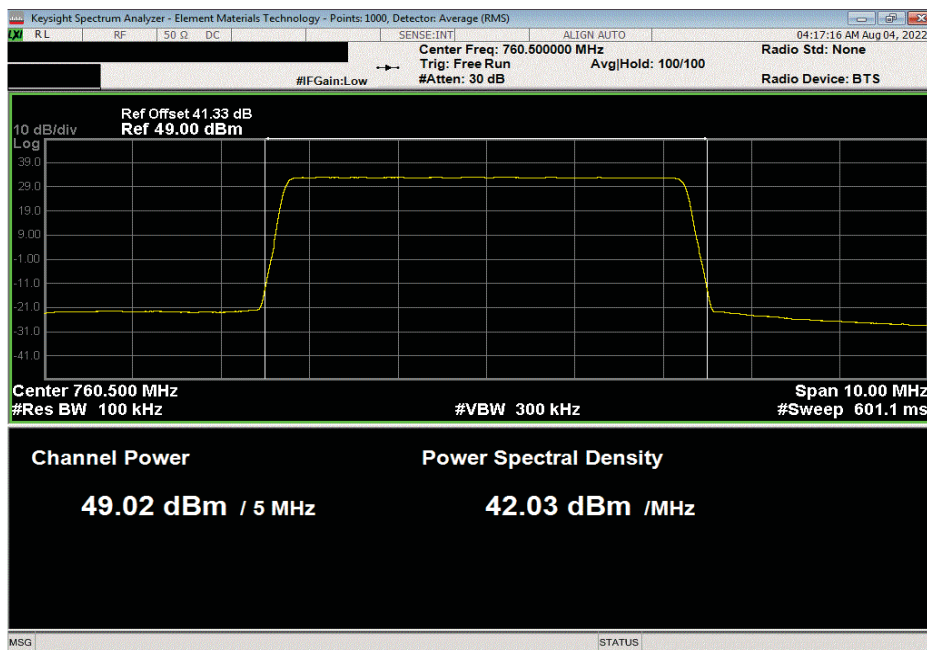


ThxTV 2022.05.02.0 XMN 2022.02.07.0

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.02	0	49	52	55		



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
49.016	0	49	52	55		

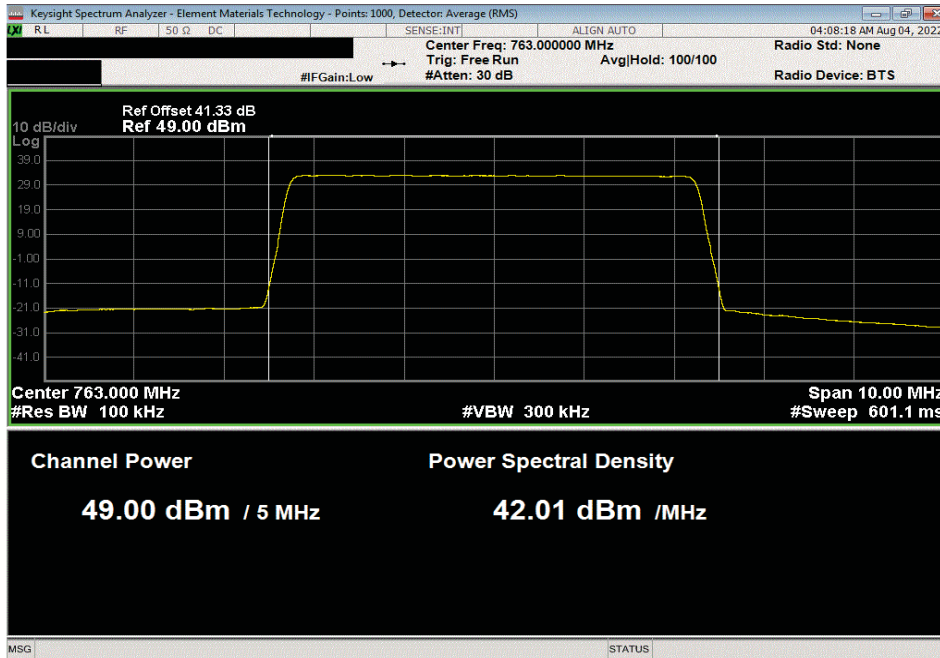


AVERAGE POWER - BAND n14

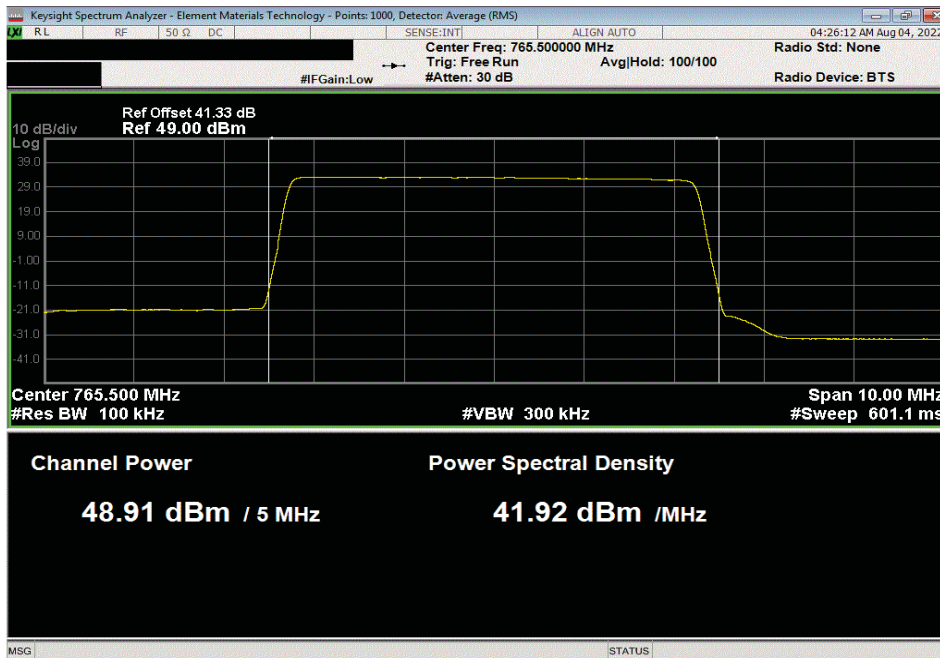


TW1x 2022.05.02.0 XM1 2022.02.07.0

Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.996	0	49	52	55		



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.91	0	48.9	51.9	54.9		

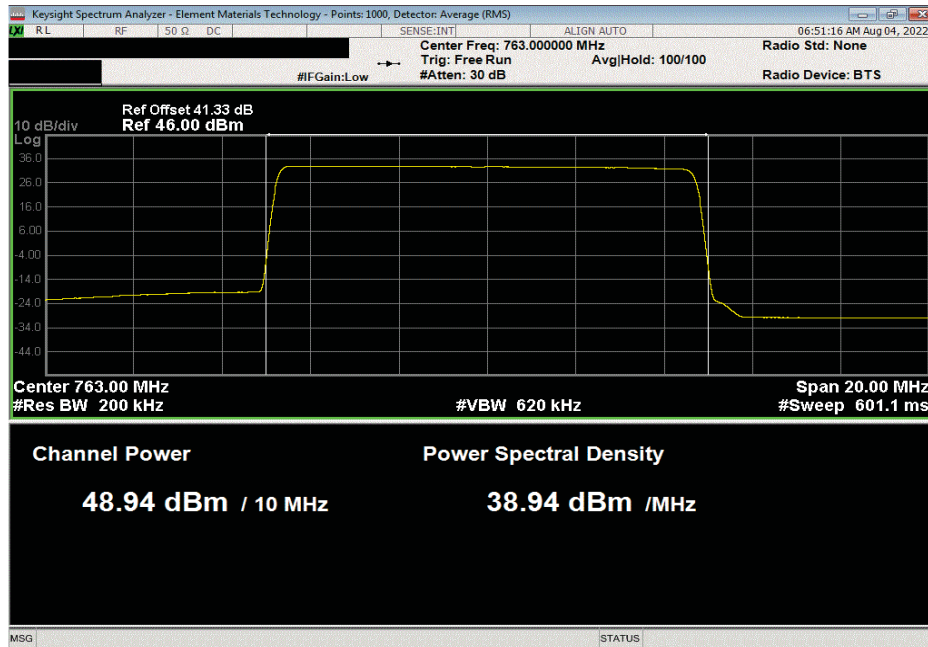


AVERAGE POWER - BAND n14



TbTb 2022 06 02 0 XMI 2022 02 07 0

Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
Initial Value	Duty Cycle	Single Port	Two Port (2x2 MIMO)	Four Port (4x4 MIMO)		
dBm/MHz	Factor (dB)	dBm/Carrier BW	dBm/Carrier BW	dBm/Carrier BW		
48.937	0	48.9	51.9	54.9		



AVERAGE POWER - MULTIBAND MULTICARRIER



XMH 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
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
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 measurement. This method uses trace averaging across ON and OFF times of the EUT transmissions in the spectrum analyzer channel power function using an RMS detector. Following the measurement a duty cycle correction was applied by adding $[10 \log (1 / D)]$, where D is the duty cycle, to the measured power to compute the average power during the actual transmission times.

AHLBBA antenna ports 1&4 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.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 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.

Multi-carrier Test Cases:

Test Case 1 (3GPP Band n12 Multicarrier): Three NR 5MHz carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band (731.5MHz & 736.5MHz) and a third carrier with maximum spacing between the other two carrier frequencies (742.5MHz) at the upper band edge. The NR 5Mhz channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12 carriers).

Test Case 2 (3GPP Band n12 and Band n14 Multicarrier/Multiband): In the Band n12 _ Two NR 5MHz carriers at the lower band edge (731.5 & 736.5MHz). In Band n14 _ one NR 5MHz carrier at the upper band edge 765.5MHz. The carriers are operated at maximum power for a total port power of 80 watts (~26.6W/Band n12/n14 carriers).

AVERAGE POWER - MULTIBAND MULTICARRIER



EUT: AHLBBA (C2PC/C3PC FCC/ISED)		Work Order: NOKI0047	
Serial Number: K9193514835		Date: 5-Aug-22	
Customer: Nokia Solutions and Networks		Temperature: 20.3 °C	
Attendees: Mitchell Hill		Humidity: 61.4% RH	
Project: None		Barometric Pres.: 1021 mbar	
Tested by: Marty Martin	Power: 54VDC	Job Site: TX07	

TEST SPECIFICATIONS		Test Method	
FCC 27:2022		ANSI C63.26:2015	
FCC 90R:2022		ANSI C63.26:2015	
RSS-130 Issue 2:2019 and RSS 140 Issue 1: 2018		ANSI C63.26:2015	

COMMENTS
All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. Band n12 and Band n14 carriers were operating at maximum power in each applicable test case to achieve a total port power of 80 watts.

DEVIATIONS FROM TEST STANDARD
None

Configuration #	2	Signature	<i>Marty Martin</i>						
			Avg Cond Initial Pwr (dBm)	Duty Cycle Factor (dB)	Avg Cond Carrier Pwr (dBm)	Avg Cond Band Pwr (dBm)	Avg Cond Port Pwr (dBm)	Limit (dBm)	Results

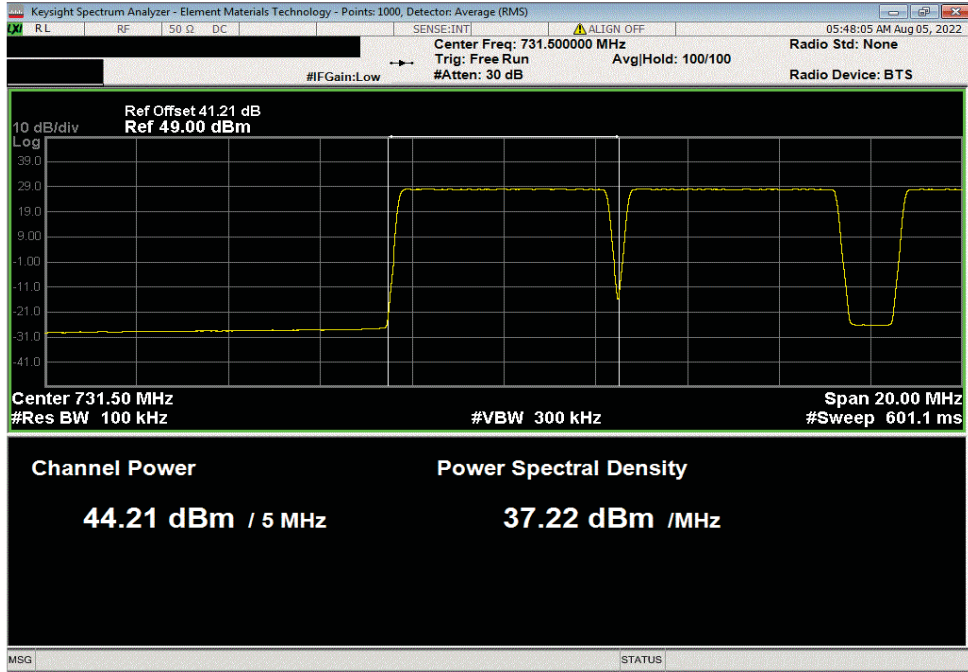
Port 1, 5G NR, Multi-Carrier Test Case 1									
Band n12, 729 - 745 Mhz									
5 MHz Bandwidth									
QPSK Modulation									
	Low Channel, 731.5 MHz	44.206	0	44.2	N/A	N/A	Within Tolerance	Pass	
	Low Channel, 736.5 MHz	44.201	0	44.2	N/A	N/A	Within Tolerance	Pass	
	High Channel, 742.5 MHz	44.116	0	44.1	N/A	N/A	Within Tolerance	Pass	
Port 2, 5G NR, Multi-Carrier Test Case 1									
Band n12, 729 - 745 Mhz									
5 MHz Bandwidth									
QPSK Modulation									
	Low Channel, 731.5 MHz	43.899	0	43.9	N/A	N/A	Within Tolerance	Pass	
	Low Channel, 736.5 MHz	44.092	0	44.1	N/A	N/A	Within Tolerance	Pass	
	High Channel, 742.5 MHz	44.144	0	44.1	N/A	N/A	Within Tolerance	Pass	
Port 1, 5G NR, Multi-Carrier Test Case 2									
Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz									
5 MHz Bandwidth									
QPSK Modulation									
	Low Channel, 731.5 MHz	44.478	0	44.5	N/A	N/A	Within Tolerance	Pass	
	Low Channel, 736.5 MHz	44.431	0	44.4	N/A	N/A	Within Tolerance	Pass	
	High Channel, 765.5 MHz	43.737	0	43.7	N/A	N/A	Within Tolerance	Pass	
Port 2, 5G NR, Multi-Carrier Test Case 2									
Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz									
5 MHz Bandwidth									
QPSK Modulation									
	Low Channel, 731.5 MHz	43.708	0	43.7	N/A	N/A	Within Tolerance	Pass	
	Low Channel, 736.5 MHz	43.903	0	43.9	N/A	N/A	Within Tolerance	Pass	
	High Channel, 765.5 MHz	43.517	0	43.5	N/A	N/A	Within Tolerance	Pass	

AVERAGE POWER - MULTIBAND MULTICARRIER

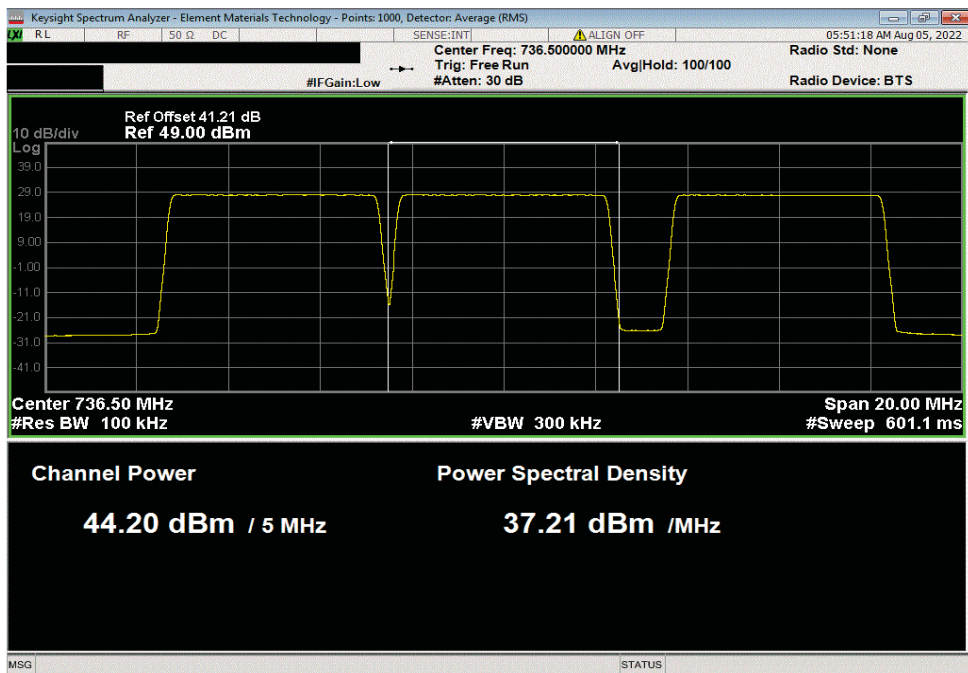


Thx 2022.05.02.0 XMM 2022.02.07.0

Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
44.206	0	44.21	N/A	N/A	Within Tolerance	Pass



Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 736.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
44.201	0	44.2	N/A	N/A	Within Tolerance	Pass

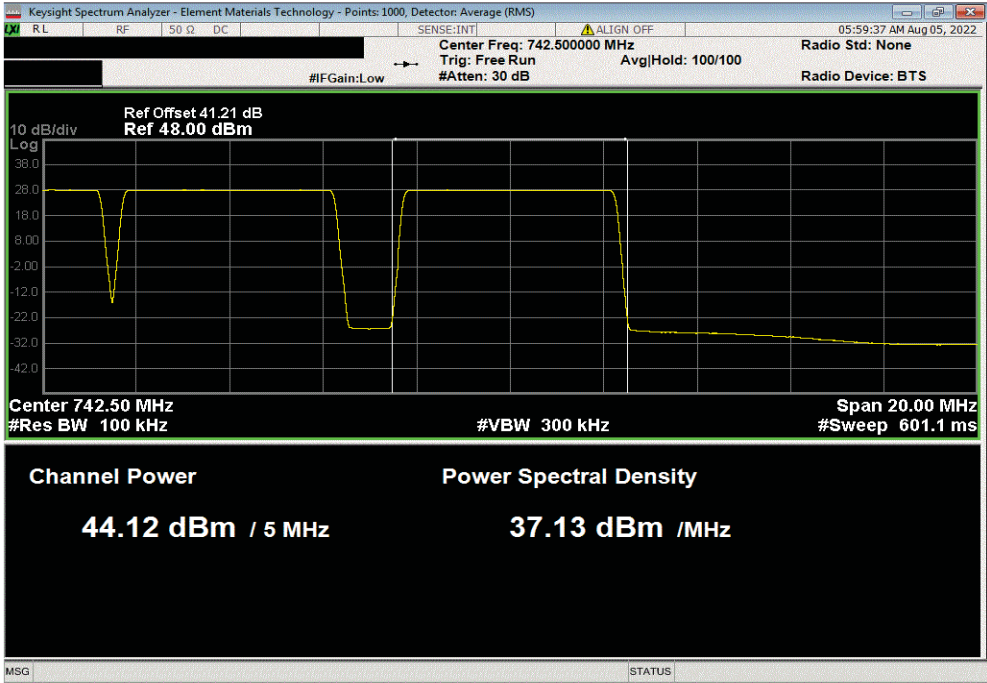


AVERAGE POWER - MULTIBAND MULTICARRIER



TbTb 2022.05.02.0 XMI 2022.02.07.0

Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 742.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
44.116	0	44.12	N/A	N/A	Within Tolerance	Pass

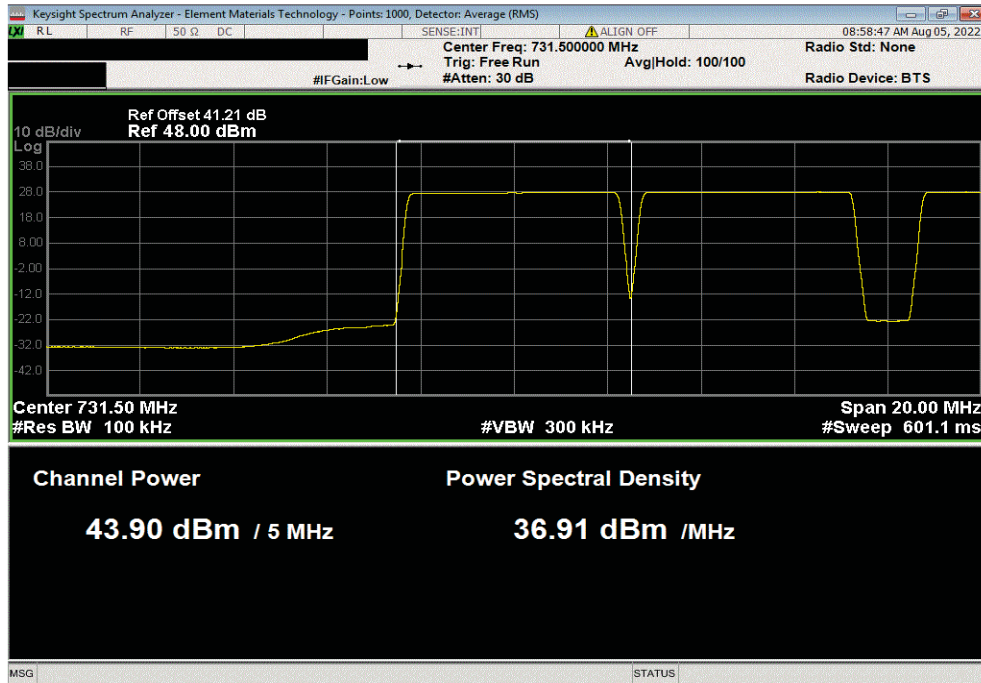


AVERAGE POWER - MULTIBAND MULTICARRIER

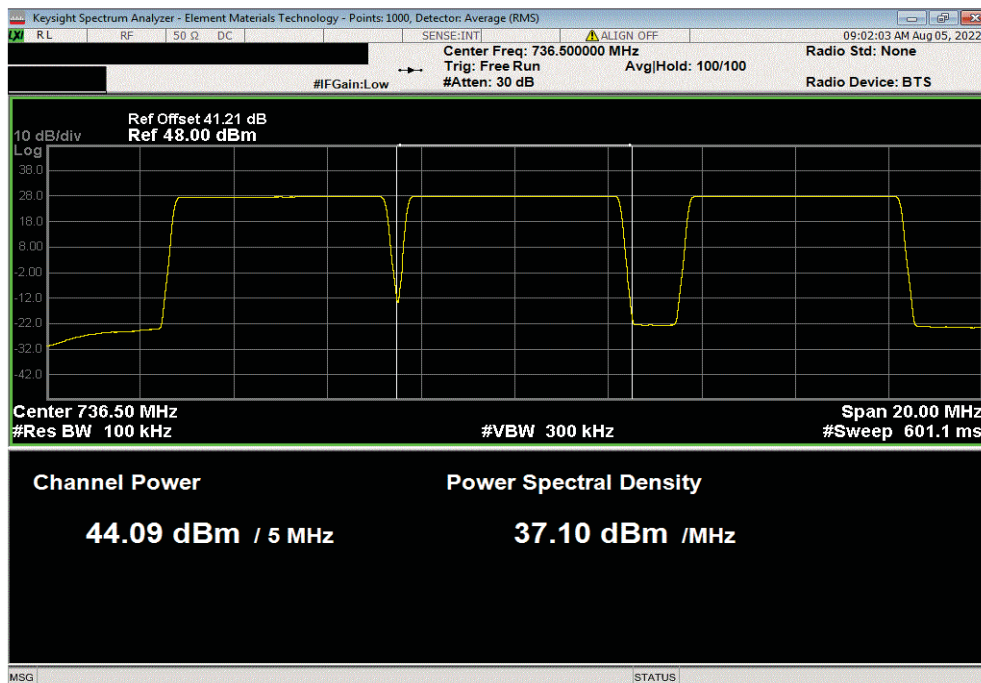


TbTx 2022.05.02.0 XMM 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
43.899	0	43.9	N/A	N/A	Within Tolerance	Pass



Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 736.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
44.092	0	44.09	N/A	N/A	Within Tolerance	Pass

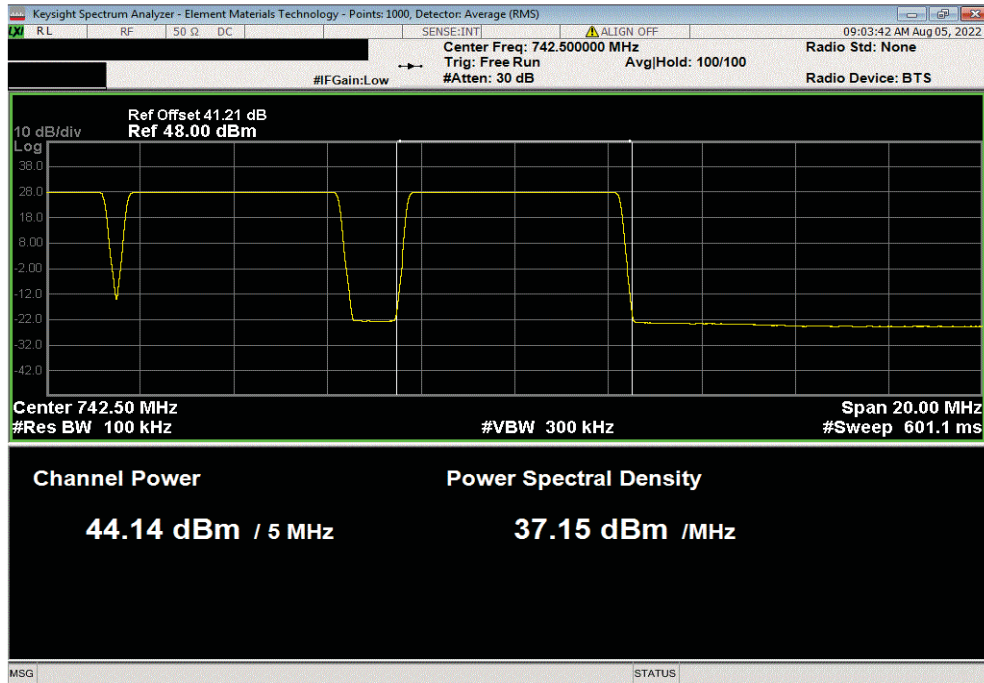


AVERAGE POWER - MULTIBAND MULTICARRIER



TMTx 2022.05.02.0 XMM 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 742.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
44.144	0	44.14	N/A	N/A	Within Tolerance	Pass

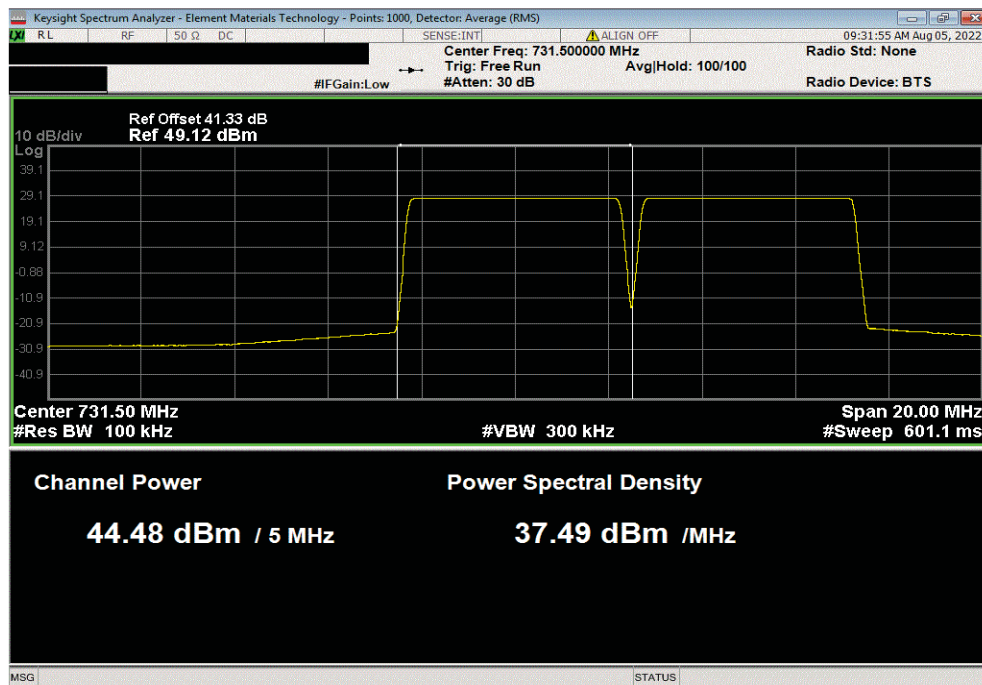


AVERAGE POWER - MULTIBAND MULTICARRIER

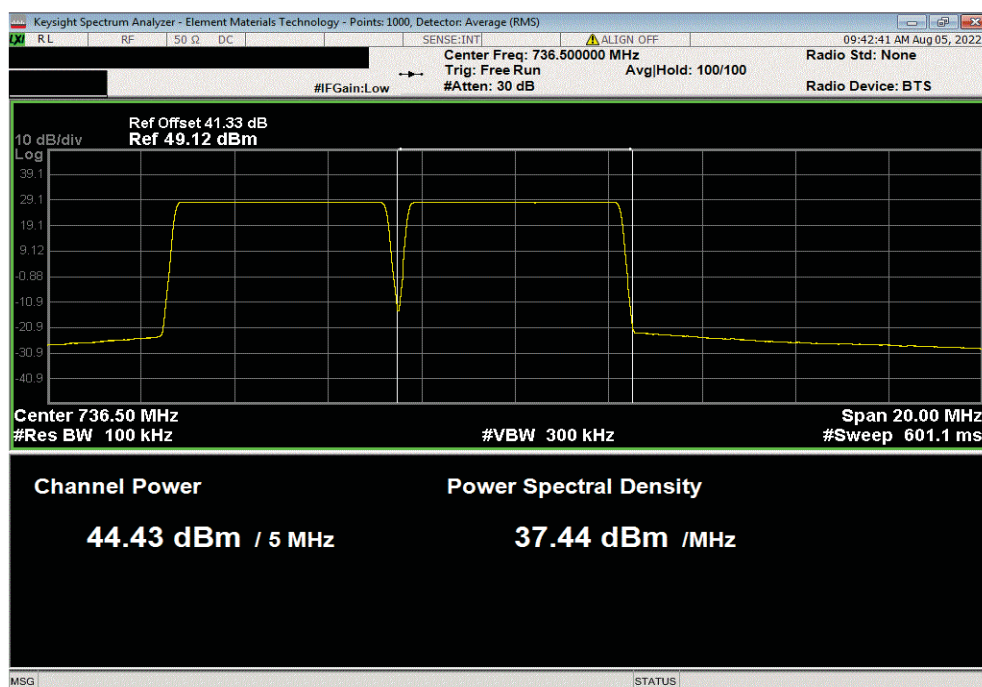


TbTx 2022.05.02.0 XMit 2022.02.07.0

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz							
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results	
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)		
44.478	0	44.48	N/A	N/A	Within Tolerance	Pass	



Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 736.5 MHz							
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results	
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)		
44.431	0	44.43	N/A	N/A	Within Tolerance	Pass	

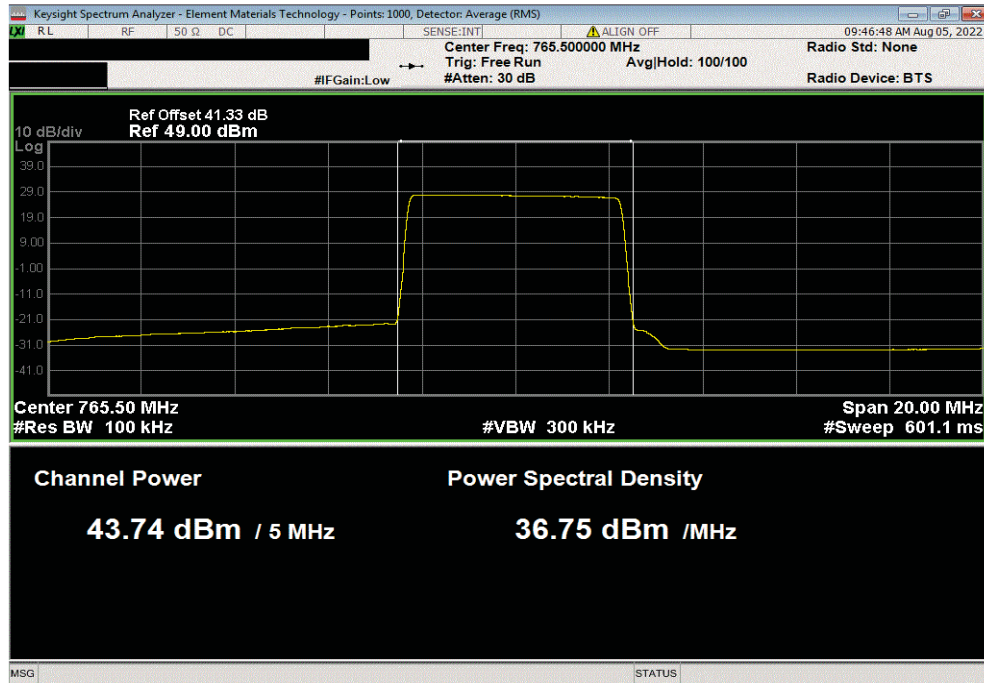


AVERAGE POWER - MULTIBAND MULTICARRIER



TbTx 2022.05.02.0 XMR 2022.02.07.0

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
43.737	0	43.74	N/A	N/A	Within Tolerance	Pass

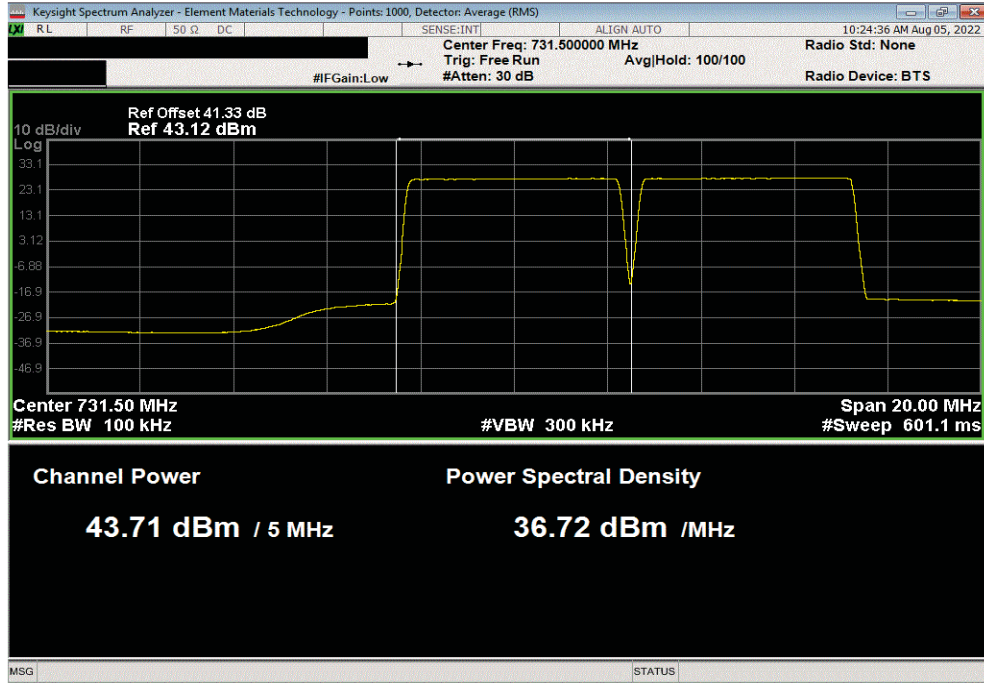


AVERAGE POWER - MULTIBAND MULTICARRIER

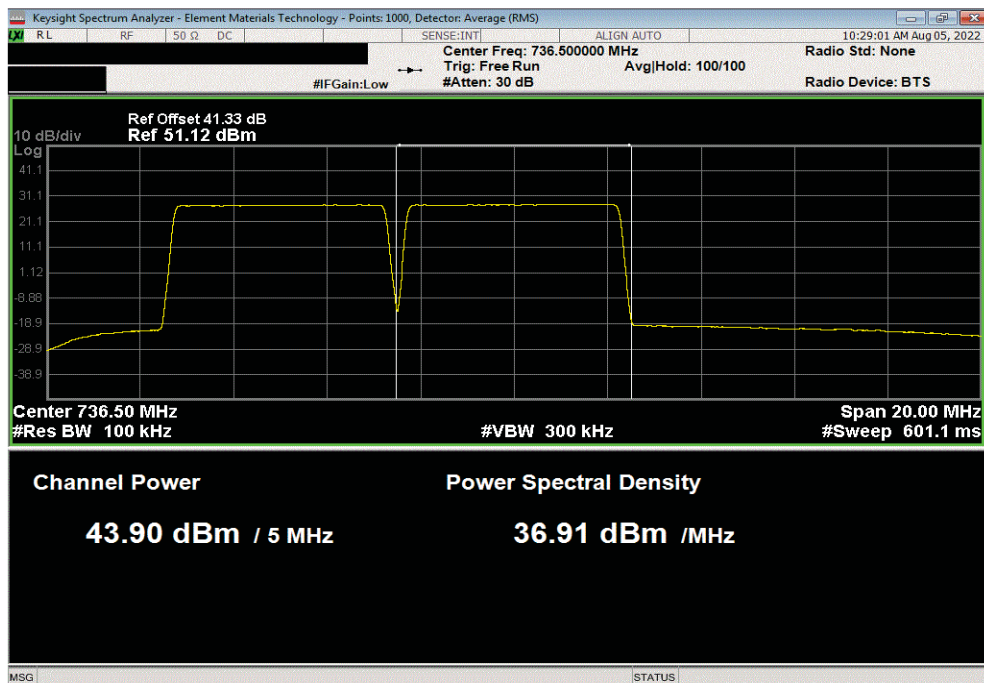


TbTx 2022.05.02.0 XbTx 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 731.5 MHz							
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results	
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)		
43.708	0	43.71	N/A	N/A	Within Tolerance	Pass	



Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, Low Channel, 736.5 MHz							
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results	
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)		
43.903	0	43.9	N/A	N/A	Within Tolerance	Pass	

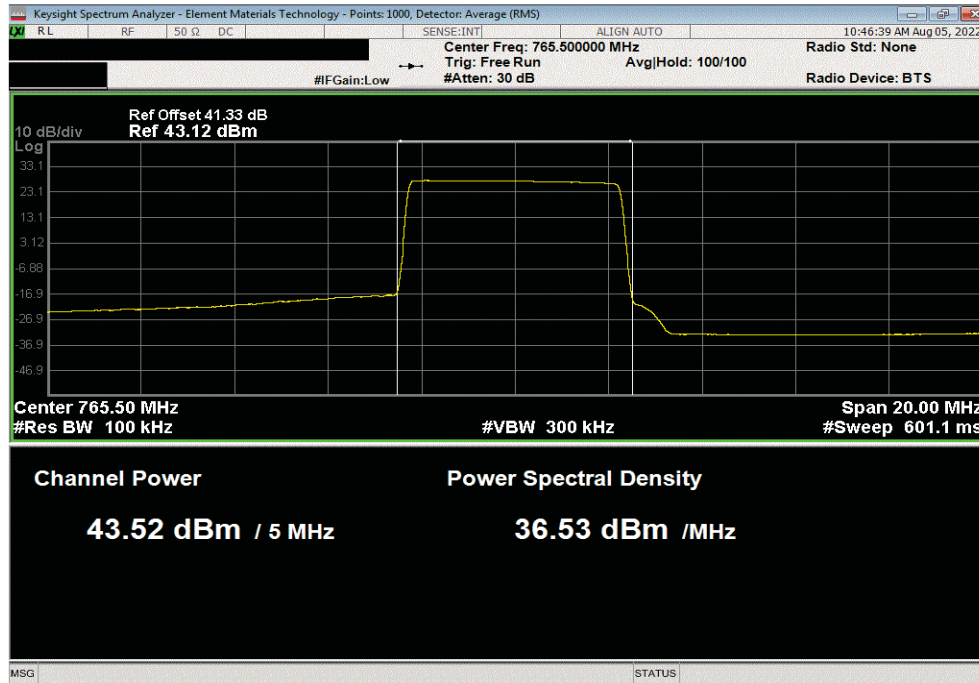


AVERAGE POWER - MULTIBAND MULTICARRIER



TbTtx 2022.05.02.0 XMt 2022.02.07.0

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation, High Channel, 765.5 MHz						
Avg Cond	Duty Cycle	Avg Cond	Avg Cond	Avg Cond	Limit	Results
Initial Pwr (dBm)	Factor (dB)	Carrier Pwr (dBm)	Band Pwr (dBm)	Port Pwr (dBm)	(dBm)	
43.517	0	43.52	N/A	N/A	Within Tolerance	Pass



AVERAGE POWER - MULTIBAND MULTICARRIER

Port 1, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation							
Avg Cond Initial Pwr (dBm)	Duty Cycle Factor (dB)	Avg Cond Carrier Pwr (dBm)	Avg Cond Band Pwr (dBm)	Avg Cond Port Pwr (dBm)	Limit (dBm)	Results	
N/A	0	N/A	View Table	View Table	Within Tolerance	Pass	

Carrier Band	Carrier Frequencies	Carrier Power (dBm)	Carrier Power (Watts)	Band Total Pwr (Watts)	Band Total Pwr (dBm)	Port Total Pwr (Watts)	Port Total Pwr (dBm)
5G NR Band n12	731.5 MHz	44.21	26.4	N/A	N/A	N/A	N/A
5G NR Band n12	736.5 MHz	44.2	26.3	N/A	N/A	N/A	N/A
5G NR Band n12	742.5 MHz	44.12	25.82	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	78.5	48.95	78.5	48.95

Port 2, 5G NR, Multi-Carrier Test Case 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation							
Avg Cond Initial Pwr (dBm)	Duty Cycle Factor (dB)	Avg Cond Carrier Pwr (dBm)	Avg Cond Band Pwr (dBm)	Avg Cond Port Pwr (dBm)	Limit (dBm)	Results	
N/A	0	N/A	View Table	View Table	Within Tolerance	Pass	

Carrier Band	Carrier Frequencies	Carrier Power (dBm)	Carrier Power (Watts)	Band Total Pwr (Watts)	Band Total Pwr (dBm)	Port Total Pwr (Watts)	Port Total Pwr (dBm)
5G NR Band n12	731.5 MHz	43.9	24.5	N/A	N/A	N/A	N/A
5G NR Band n12	736.5 MHz	44.1	25.7	N/A	N/A	N/A	N/A
5G NR Band n12	742.5 MHz	44.12	25.82	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	76.1	48.82	76.1	48.82

Port 1, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation							
Avg Cond Initial Pwr (dBm)	Duty Cycle Factor (dB)	Avg Cond Carrier Pwr (dBm)	Avg Cond Band Pwr (dBm)	Avg Cond Port Pwr (dBm)	Limit (dBm)	Results	
N/A	0	N/A	View Table	View Table	Within Tolerance	Pass	

Carrier Band	Carrier Frequencies	Carrier Power (dBm)	Carrier Power (Watts)	Band Total Pwr (Watts)	Band Total Pwr (dBm)	Port Total Pwr (Watts)	Port Total Pwr (dBm)
5G NR Band n12 and Band n14	731.5 MHz	44.48	28.1	N/A	N/A	N/A	N/A
5G NR Band n12 and Band n14	736.5 MHz	44.43	27.7	N/A	N/A	N/A	N/A
5G NR Band n12 and Band n14	765.5 MHz	43.74	23.66	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	79.4	49	79.4	49

Port 2, 5G NR, Multi-Carrier Test Case 2, Band n12, 729 - 745 Mhz, Band n14 758 - 768 MHz, 5 MHz Bandwidth, QPSK Modulation							
Avg Cond Initial Pwr (dBm)	Duty Cycle Factor (dB)	Avg Cond Carrier Pwr (dBm)	Avg Cond Band Pwr (dBm)	Avg Cond Port Pwr (dBm)	Limit (dBm)	Results	
N/A	0	N/A	View Table	View Table	Within Tolerance	Pass	

Carrier Band	Carrier Frequencies	Carrier Power (dBm)	Carrier Power (Watts)	Band Total Pwr (Watts)	Band Total Pwr (dBm)	Port Total Pwr (Watts)	Port Total Pwr (dBm)
5G NR Band n12 and Band n14	731.5 MHz	43.71	23.5	N/A	N/A	N/A	N/A
5G NR Band n12 and Band n14	736.5 MHz	43.9	24.6	N/A	N/A	N/A	N/A
5G NR Band n12 and Band n14	765.5 MHz	43.52	22.49	N/A	N/A	N/A	N/A
	N/A	N/A	N/A	70.5	46.9	70.5	46.9

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



XMH 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
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
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.

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

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

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

AHLBBA antenna ports 1&4 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.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TelTx 2022.05.02.0 XMit 2022.02.07.0

EUT: AHLBBA (C2PC/C3PC FCC/ISED)		Work Order: NOKI0047	
Serial Number: K9193514835		Date: 30-Jul-22	
Customer: Nokia Solutions and Networks		Temperature: 20.6 °C	
Attendees: Mitchell Hill		Humidity: 59.4% RH	
Project: None		Barometric Pres.: 1021 mbar	
Tested by: Marty Martin	Power: 54VDC	Job Site: TX07	
TEST SPECIFICATIONS			
FCC 27:2022		Test Method	
RSS-130 Issue 2: 2019		ANSI C63.26:2015	
		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Marty Martin</i>	
		PAPR Value (dB)	PAPR Limit (dB)
			Results

Port 1			
Band n12, 729 - 745 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
	Mid Channel, 737.0 MHz	7.72	13 Pass
16QAM Modulation			
	Mid Channel, 737.0 MHz	7.82	13 Pass
64QAM Modulation			
	Mid Channel, 737.0 MHz	7.69	13 Pass
256QAM Modulation			
	Low Channel, 731.5 MHz	7.70	13 Pass
	Mid Channel, 737.0 MHz	7.70	13 Pass
	High Channel, 742.5 MHz	7.69	13 Pass
10 MHz Bandwidth			
256QAM Modulation			
	Low Channel, 734 MHz	7.72	13 Pass
	Mid Channel, 737.0 MHz	7.77	13 Pass
	High Channel, 740 MHz	7.77	13 Pass
15 MHz Bandwidth			
256QAM Modulation			
	Low Channel, 736.5 MHz	7.69	13 Pass
	Mid Channel, 737.0 MHz	7.73	13 Pass
	High Channel, 737.5 MHz	7.69	13 Pass
Port 2			
Band n12, 729 - 745 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
	Mid Channel, 737.0 MHz	6.71	13 Pass
16QAM Modulation			
	Mid Channel, 737.0 MHz	6.88	13 Pass
64QAM Modulation			
	Mid Channel, 737.0 MHz	6.69	13 Pass
256QAM Modulation			
	Low Channel, 731.5 MHz	6.76	13 Pass
	Mid Channel, 737.0 MHz	6.69	13 Pass
	High Channel, 742.5 MHz	6.71	13 Pass
10 MHz Bandwidth			
256QAM Modulation			
	Low Channel, 734 MHz	6.98	13 Pass
	Mid Channel, 737.0 MHz	6.82	13 Pass
	High Channel, 740 MHz	6.77	13 Pass
15 MHz Bandwidth			
256QAM Modulation			
	Low Channel, 736.5 MHz	7.09	13 Pass
	Mid Channel, 737.0 MHz	7.04	13 Pass
	High Channel, 737.5 MHz	7.00	13 Pass

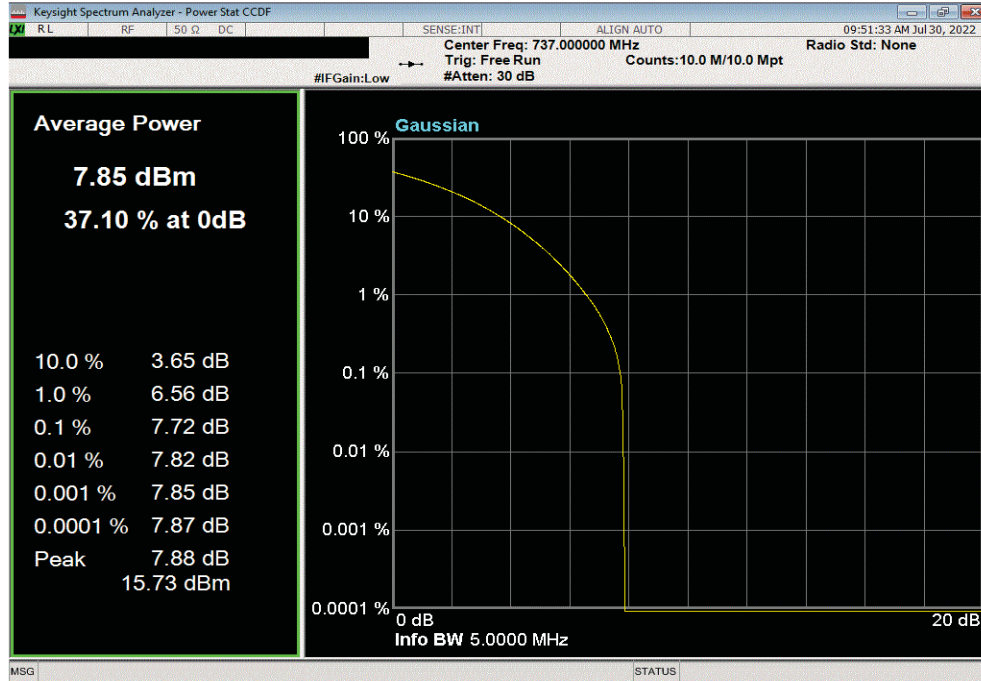
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XbTx 2022.02.07.0

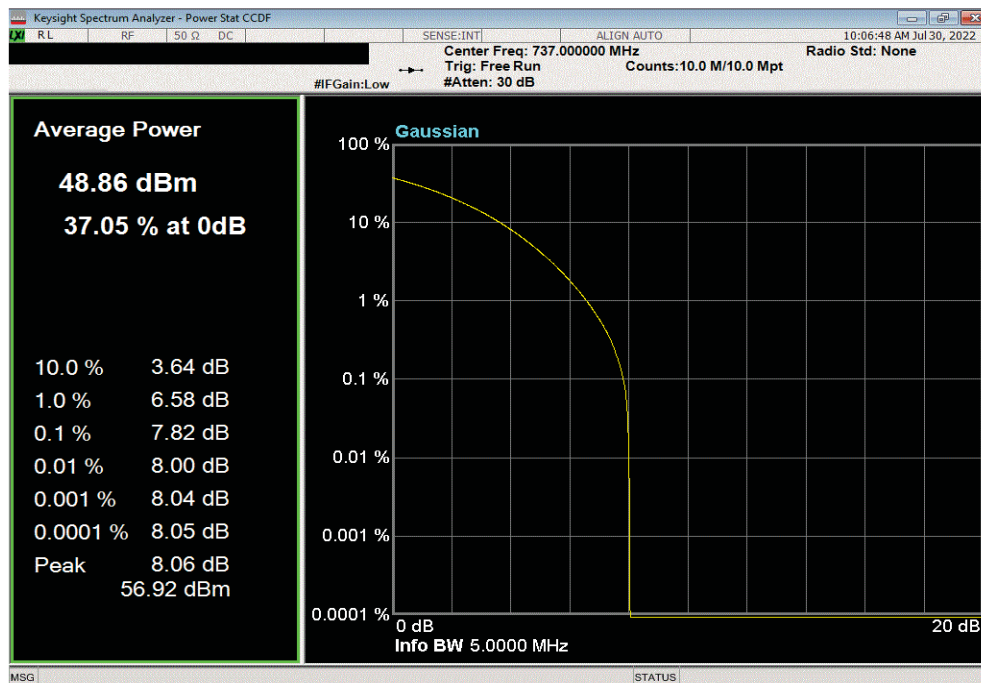
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.72	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.82	13	Pass



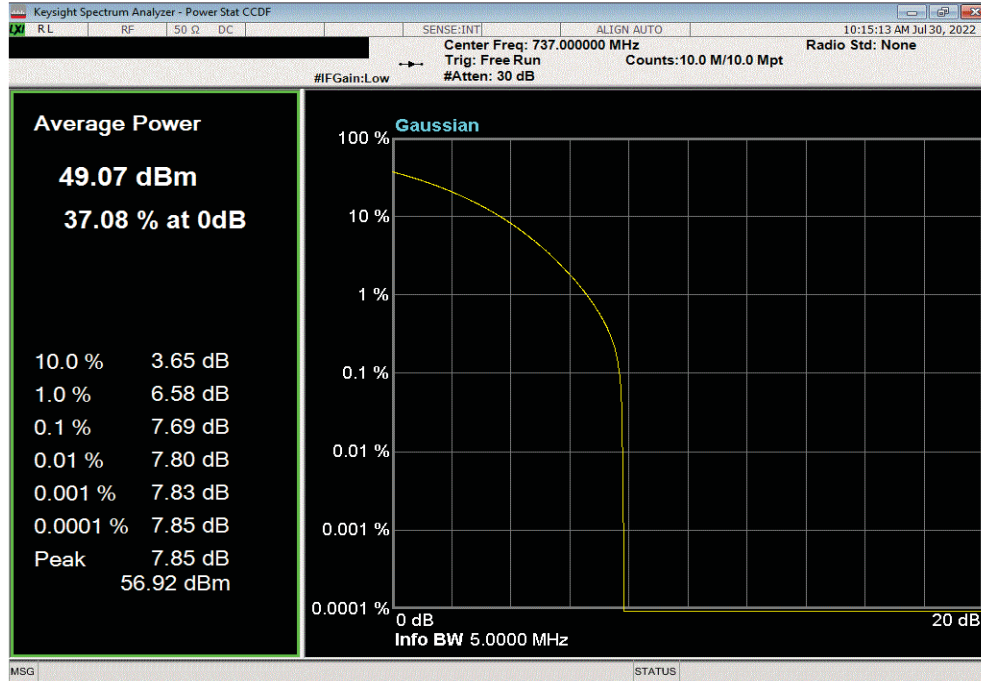
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XbTx 2022.02.07.0

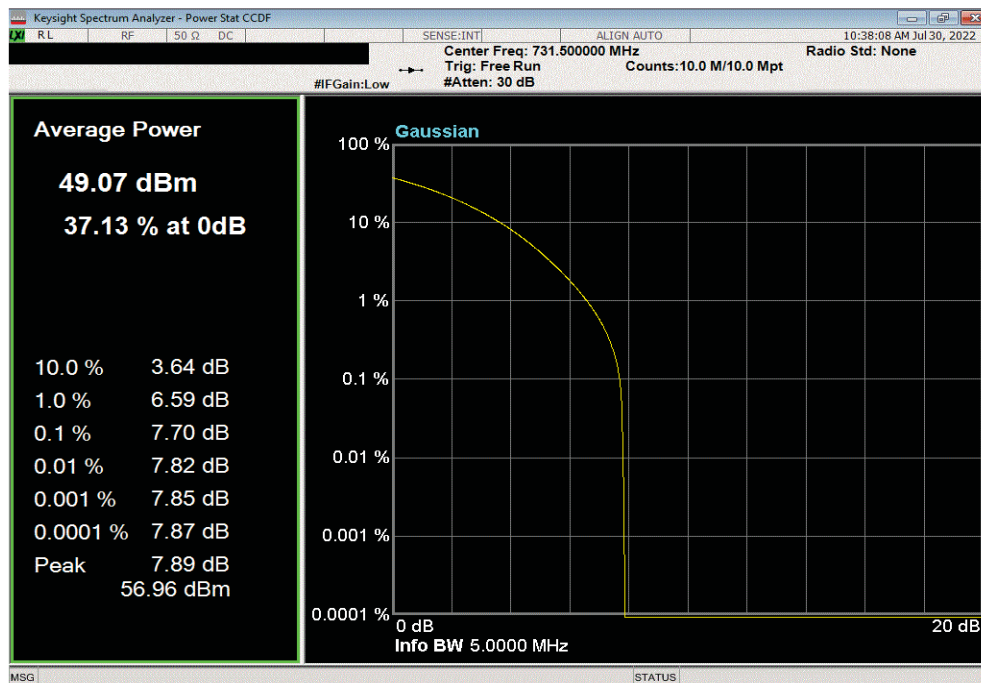
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.69	13	Pass



Port, 1 Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.7	13	Pass



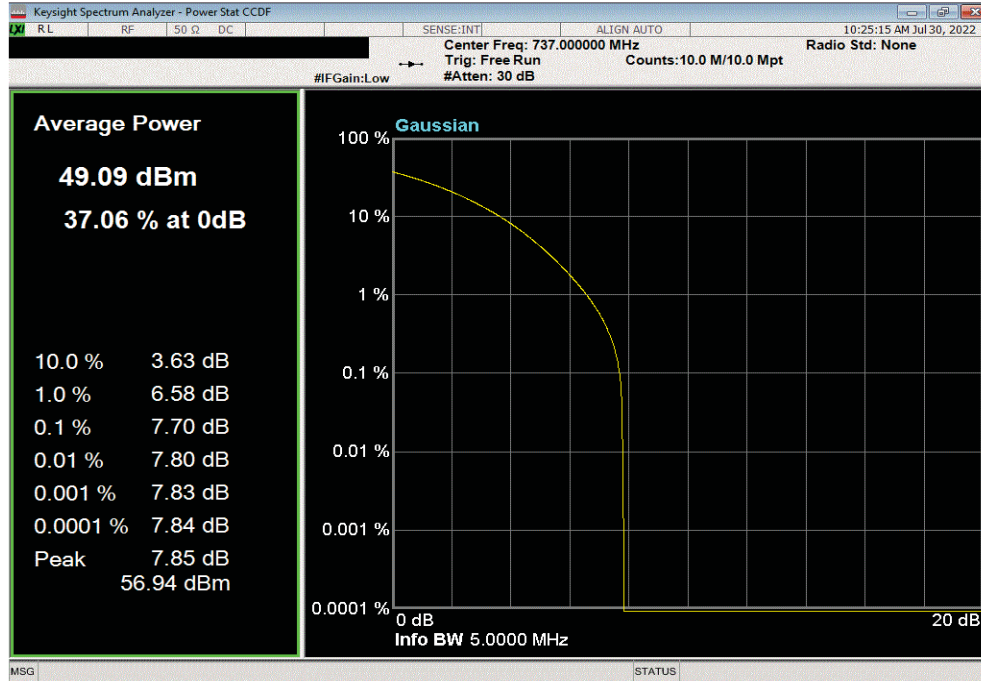
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTtx 2022.05.02.0 XMit 2022.02.07.0

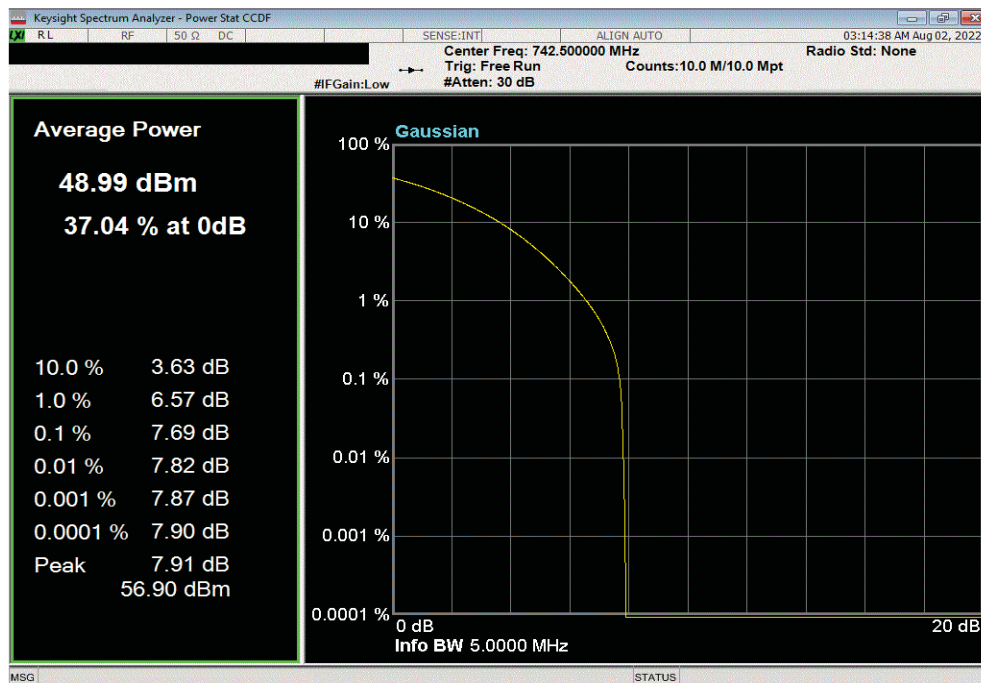
Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.7	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.69	13	Pass



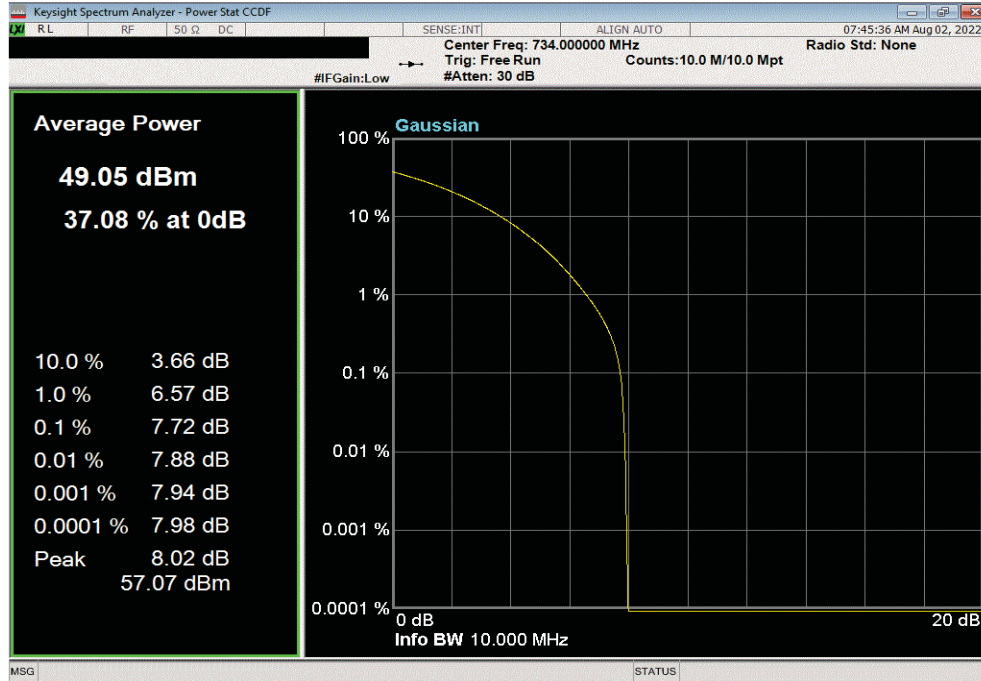
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTtx 2022.05.02.0 XMit 2022.02.07.0

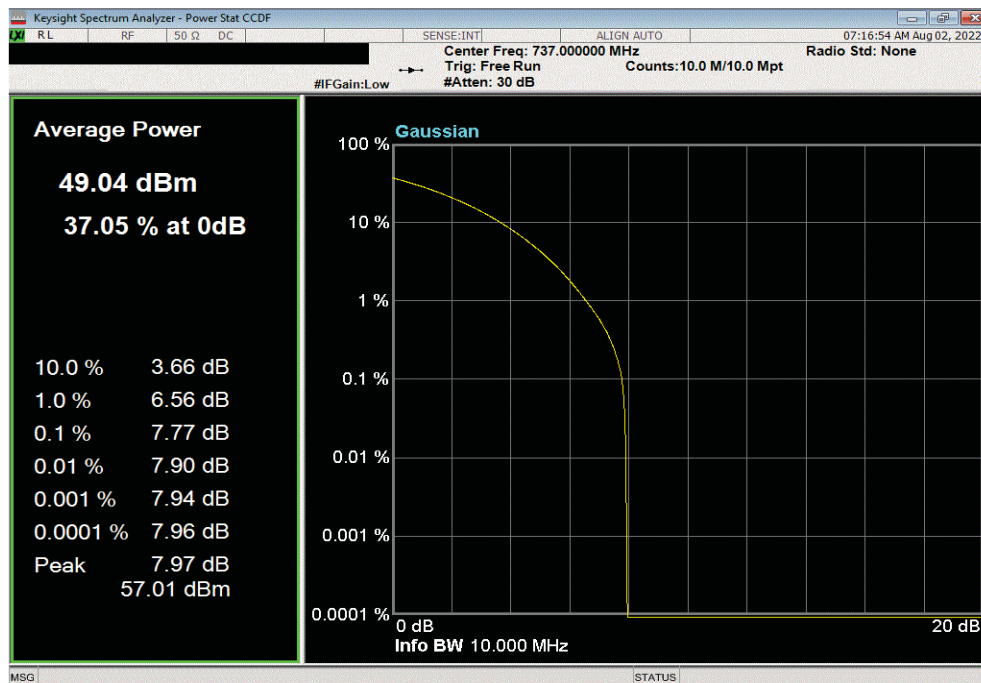
Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.72	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.77	13	Pass

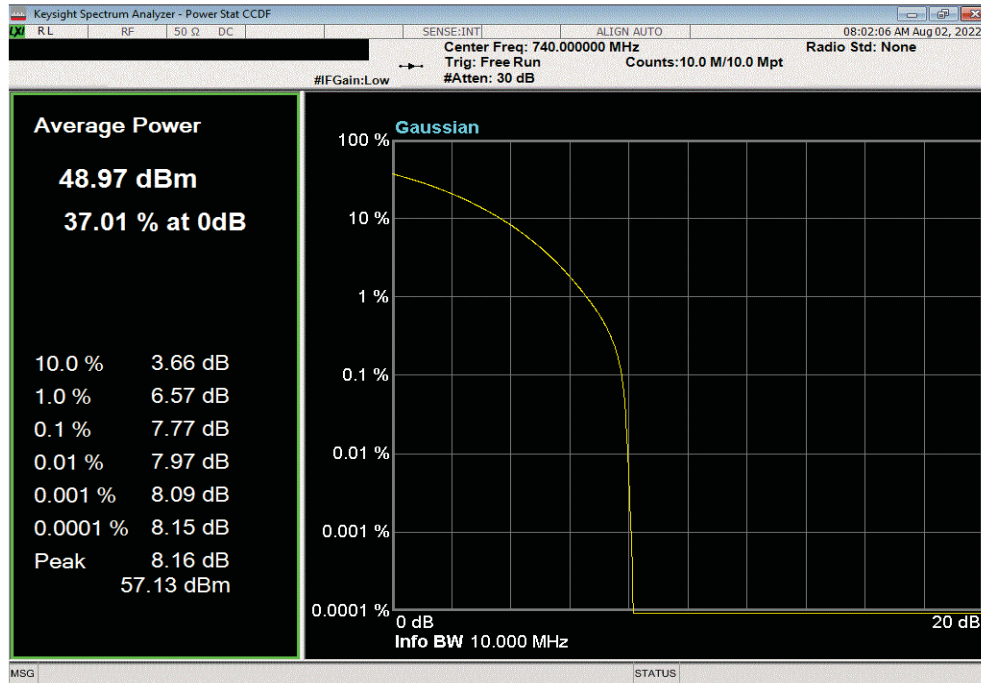


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

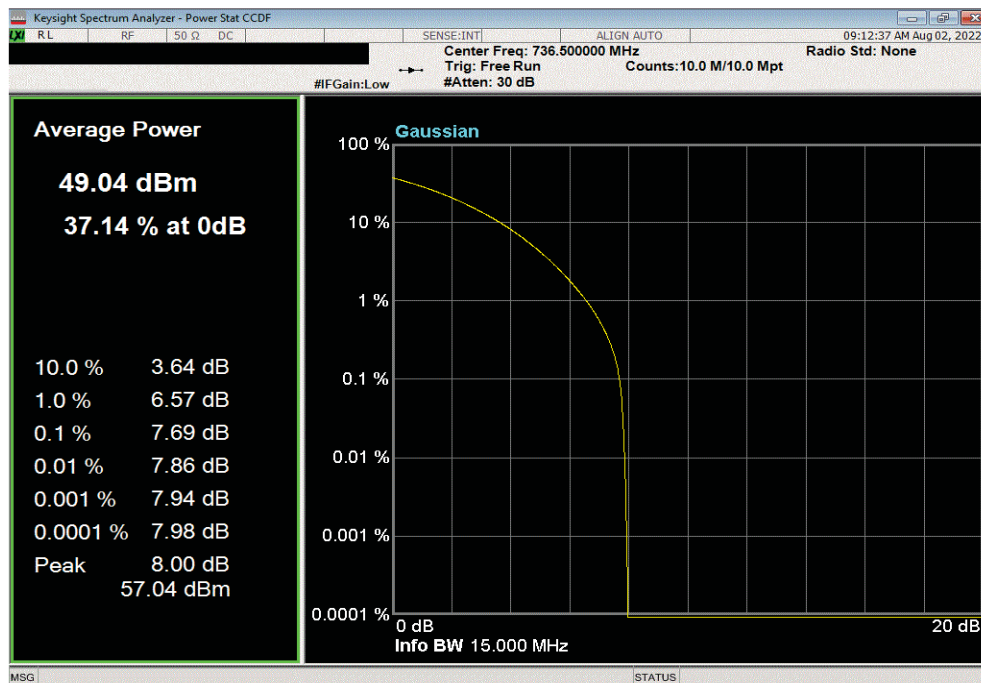


TbTtx 2022.05.02.0 XMit 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.77	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.69	13	Pass

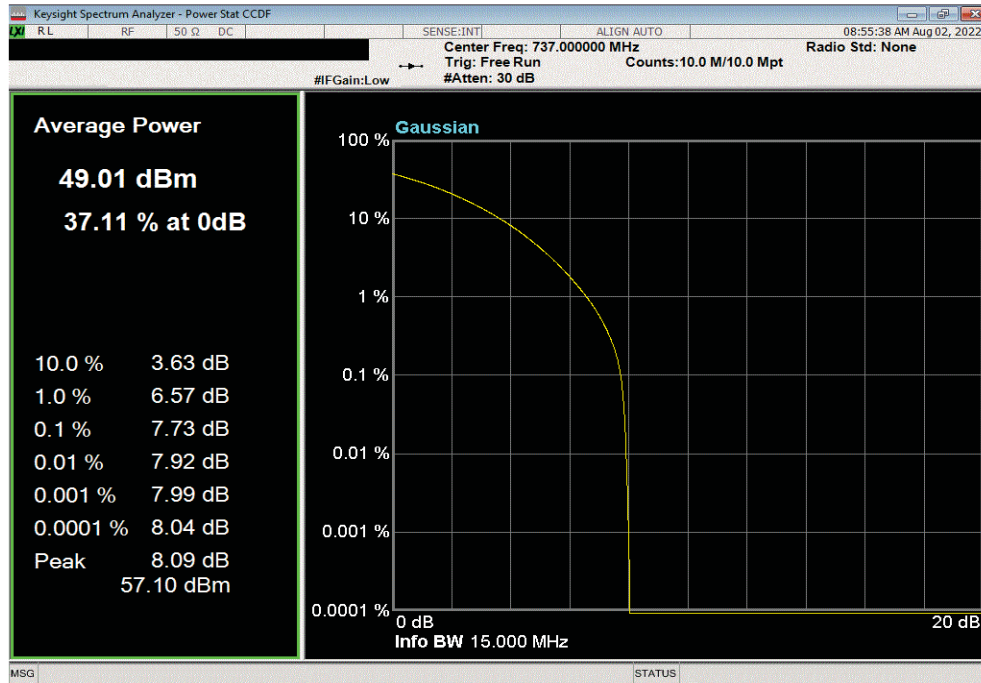


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

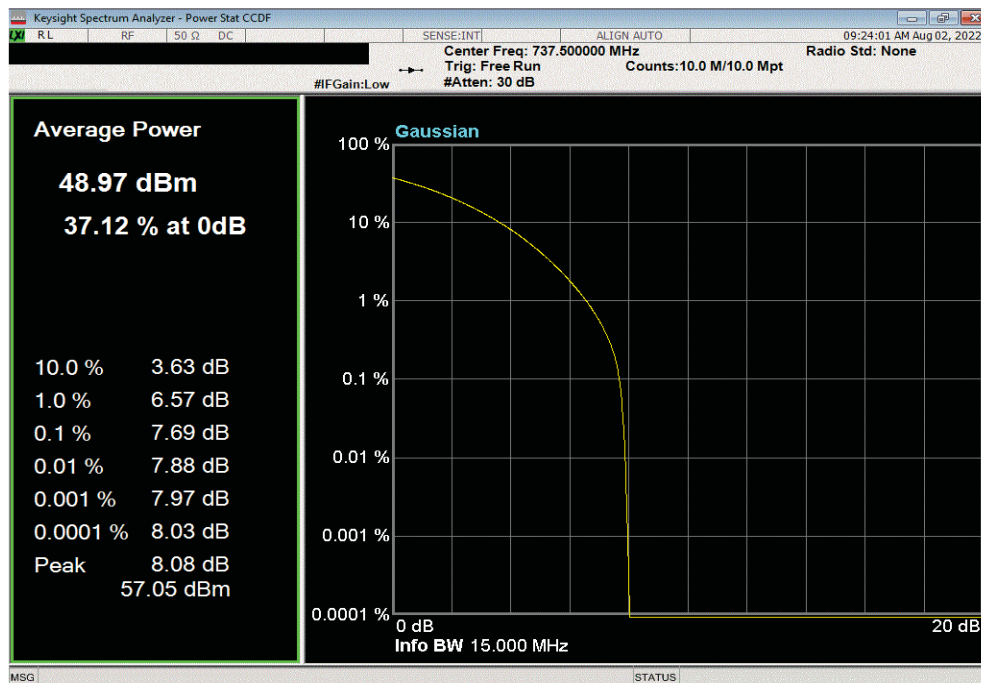


TbTtx 2022.05.02.0 XMit 2022.02.07.0

Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.73	13	Pass



Port 1, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.69	13	Pass



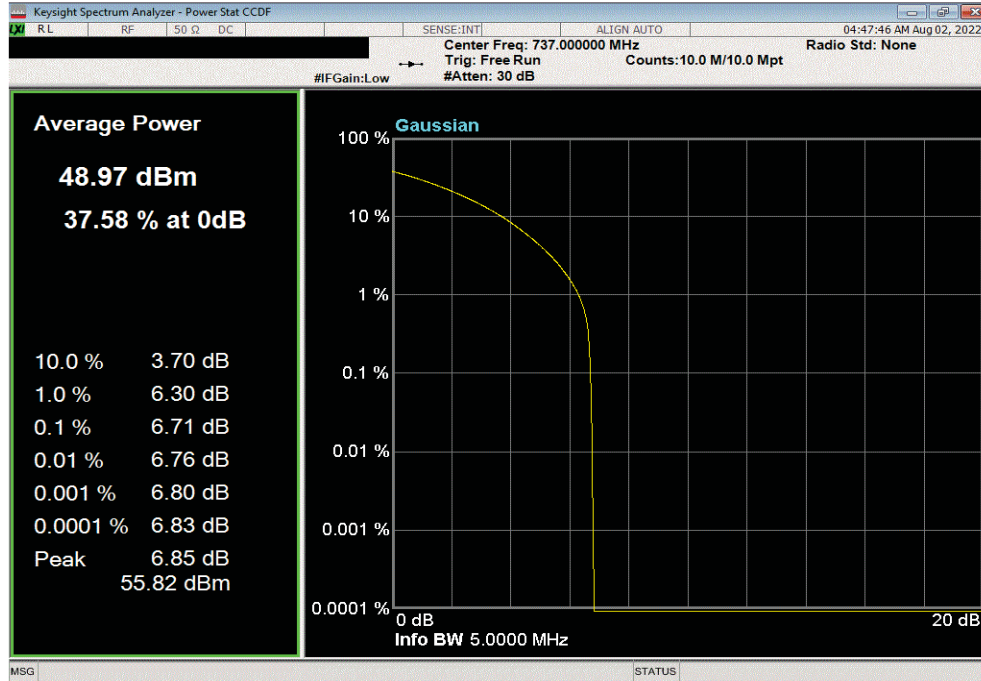
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XMit 2022.02.07.0

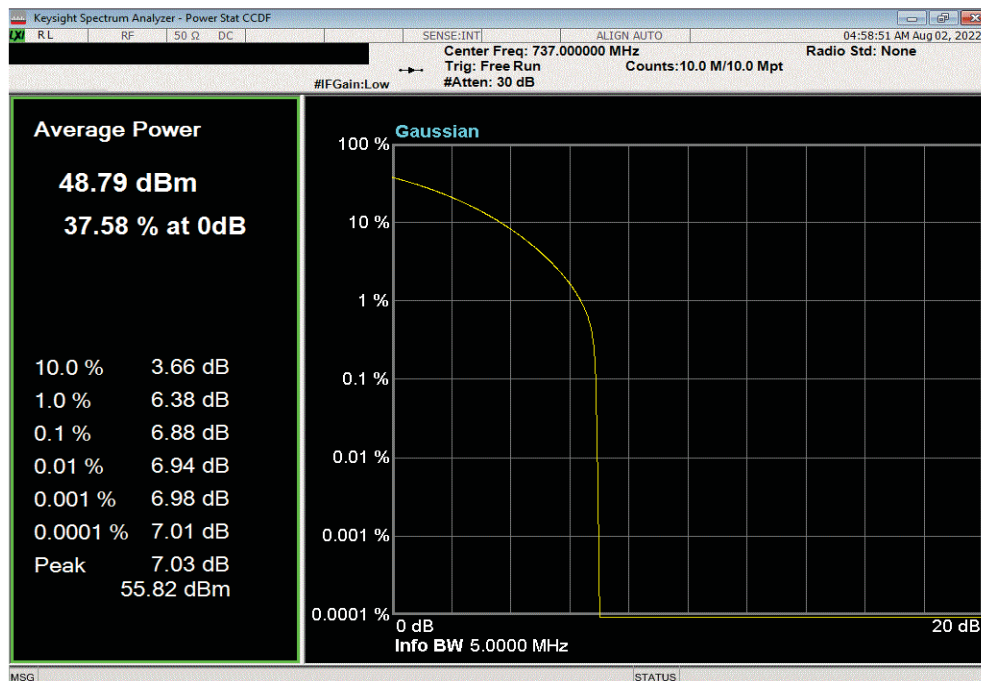
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 737.0 MHz

	Value (dB)	Limit < (dB)	Results
	6.71	13	Pass



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 737.0 MHz

	Value (dB)	Limit < (dB)	Results
	6.88	13	Pass



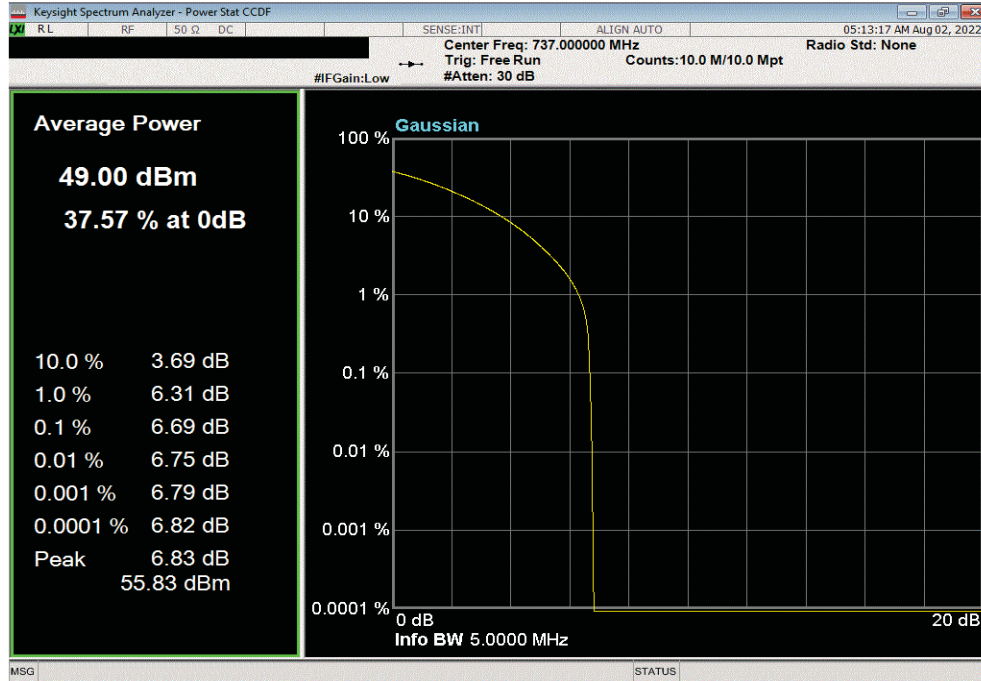
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XMit 2022.02.07.0

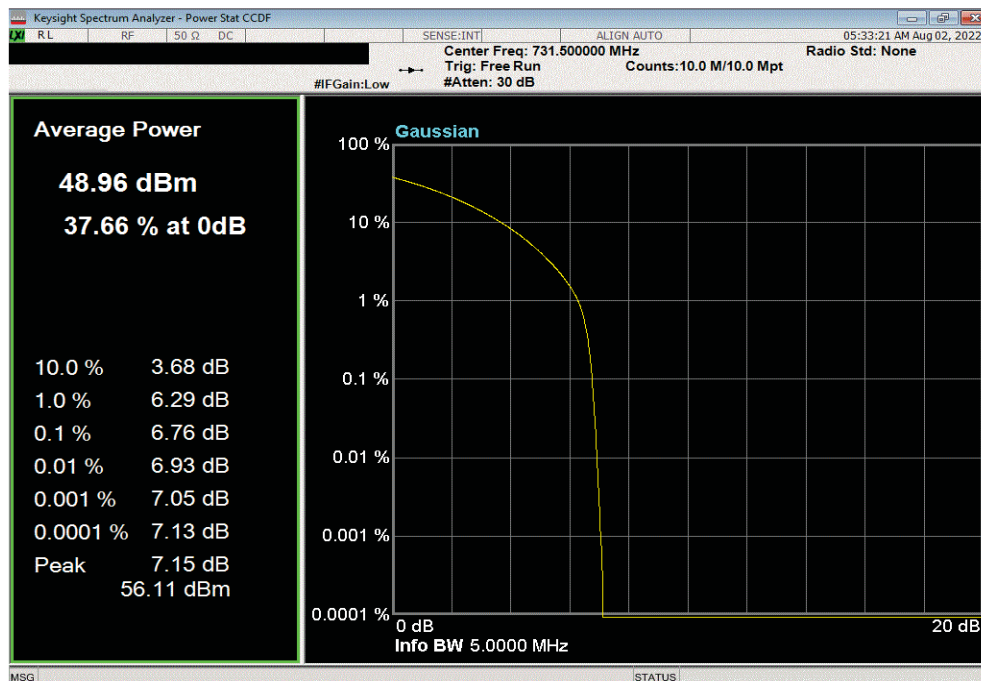
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 737.0 MHz

	Value (dB)	Limit < (dB)	Results
	6.69	13	Pass



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 731.5 MHz

	Value (dB)	Limit < (dB)	Results
	6.76	13	Pass



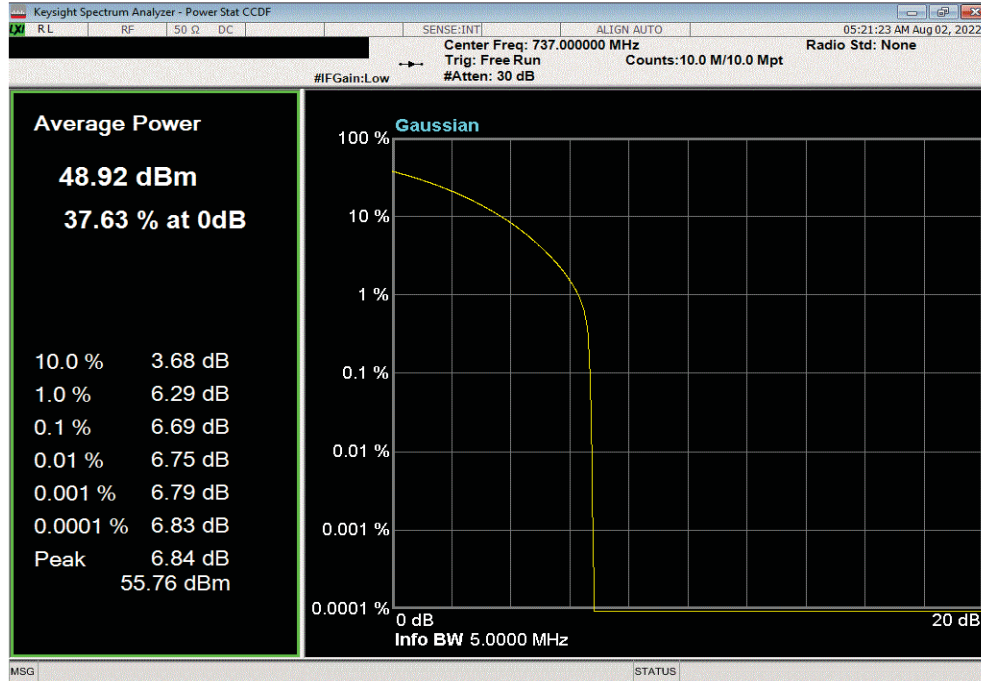
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTtx 2022.05.02.0 XMit 2022.02.07.0

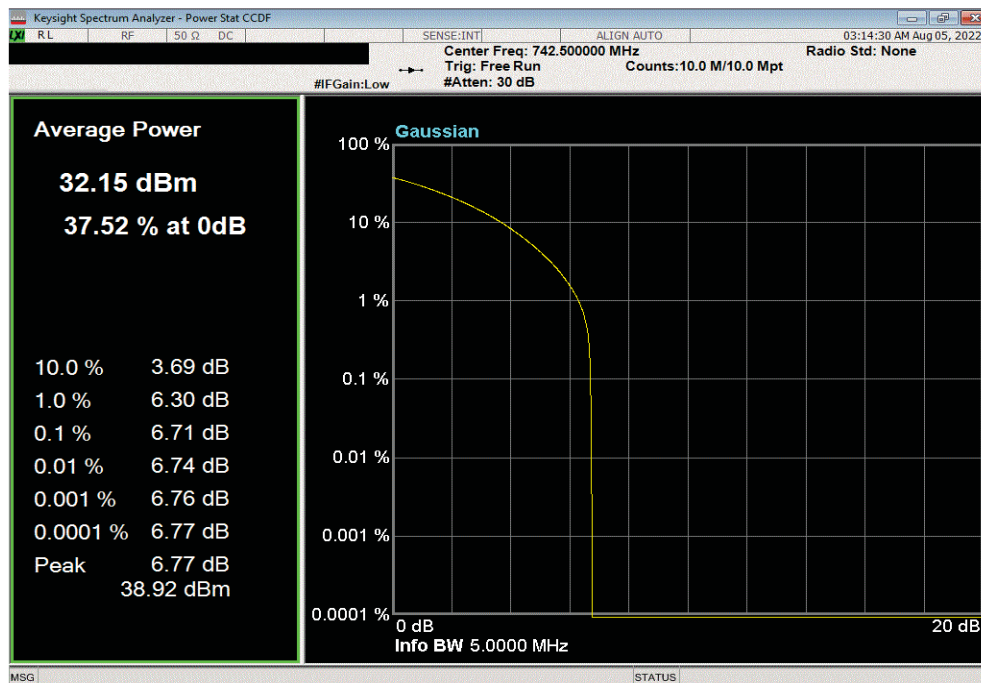
Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz

	Value (dB)	Limit < (dB)	Results
	6.69	13	Pass



Port 2, Band n12, 729 - 745 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 742.5 MHz

	Value (dB)	Limit < (dB)	Results
	6.71	13	Pass



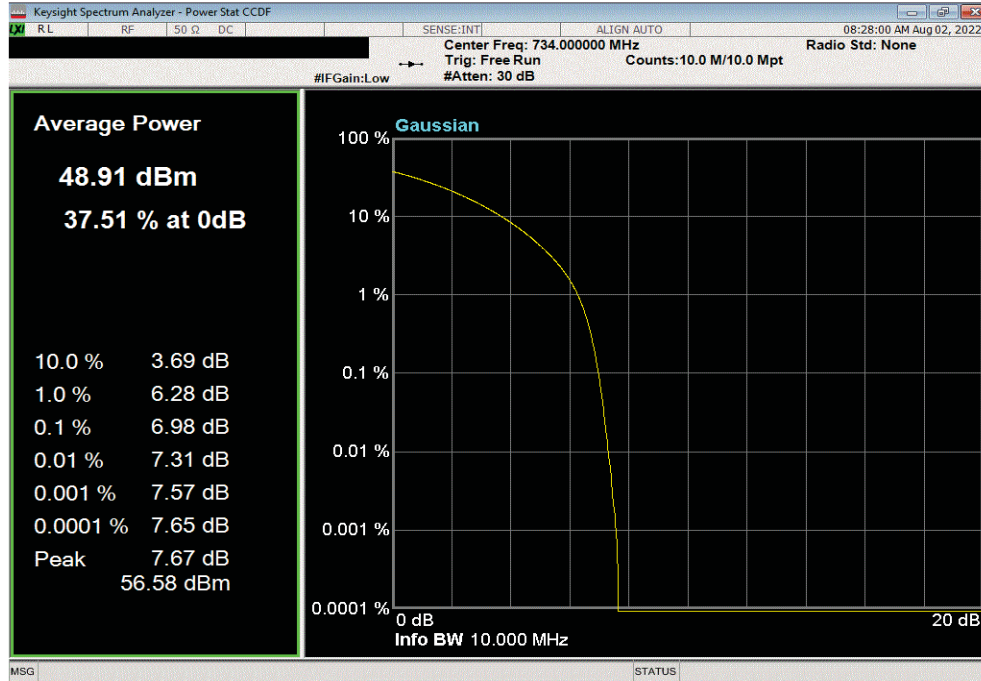
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XMit 2022.02.07.0

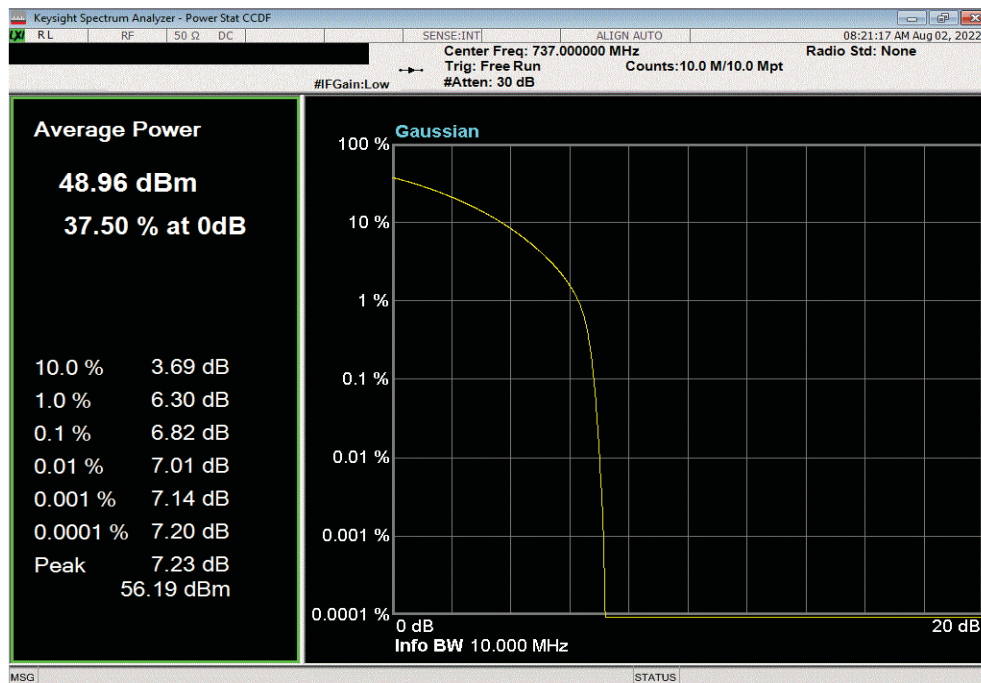
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Low Channel, 734 MHz

	Value (dB)	Limit < (dB)	Results
	6.98	13	Pass



Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz

	Value (dB)	Limit < (dB)	Results
	6.82	13	Pass



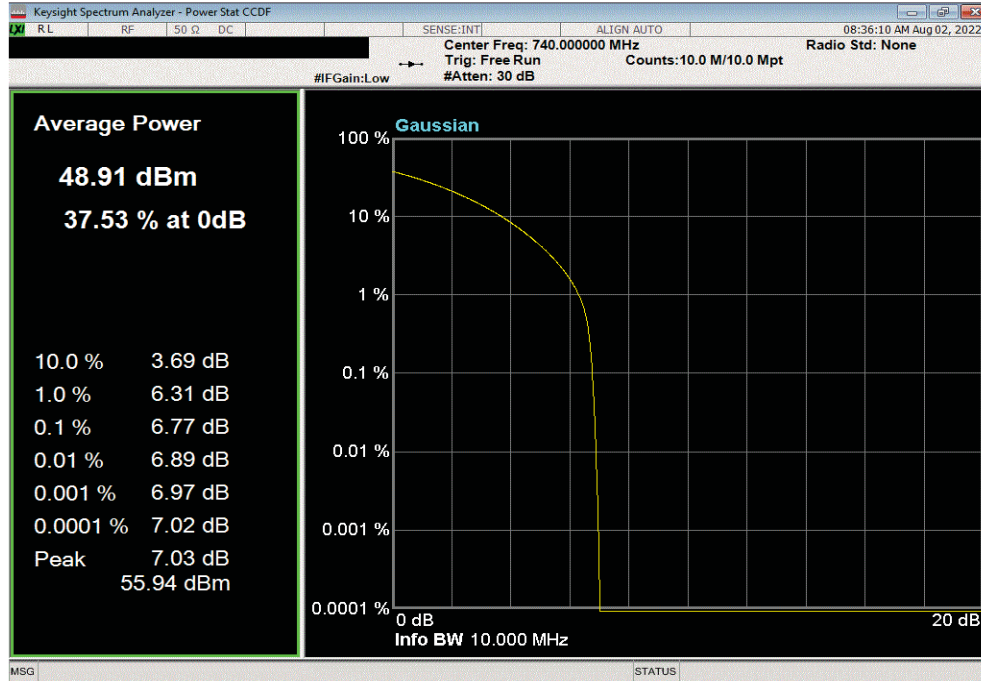
PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12



TbTx 2022.05.02.0 XMit 2022.02.07.0

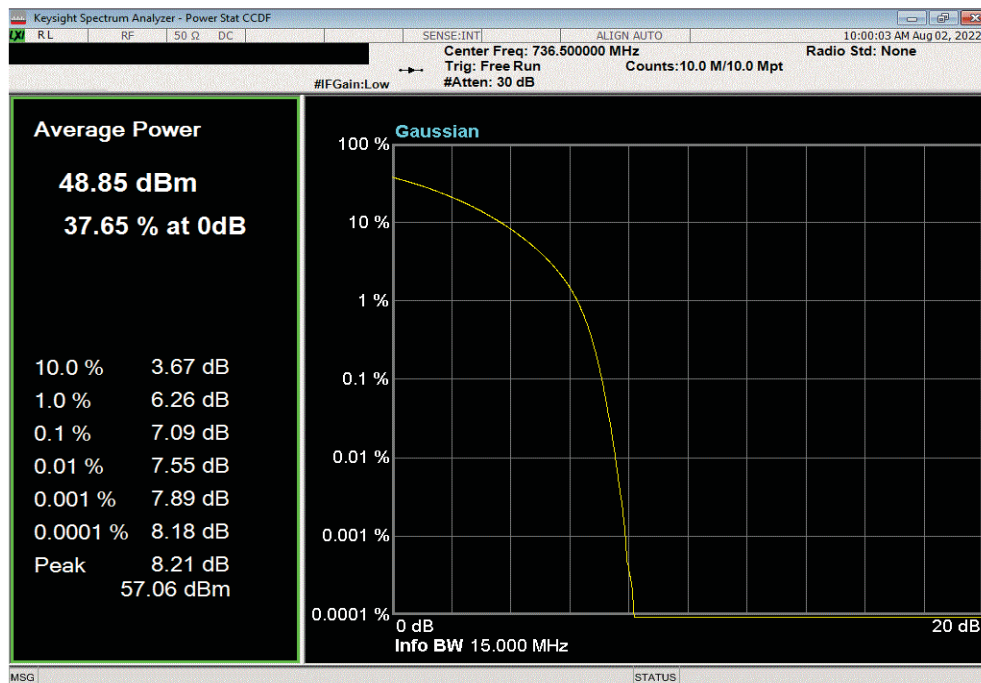
Port 2, Band n12, 729 - 745 Mhz, 10 MHz Bandwidth, 256QAM Modulation, High Channel, 740 MHz

	Value (dB)	Limit < (dB)	Results
	6.77	13	Pass



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Low Channel, 736.5 MHz

	Value (dB)	Limit < (dB)	Results
	7.09	13	Pass

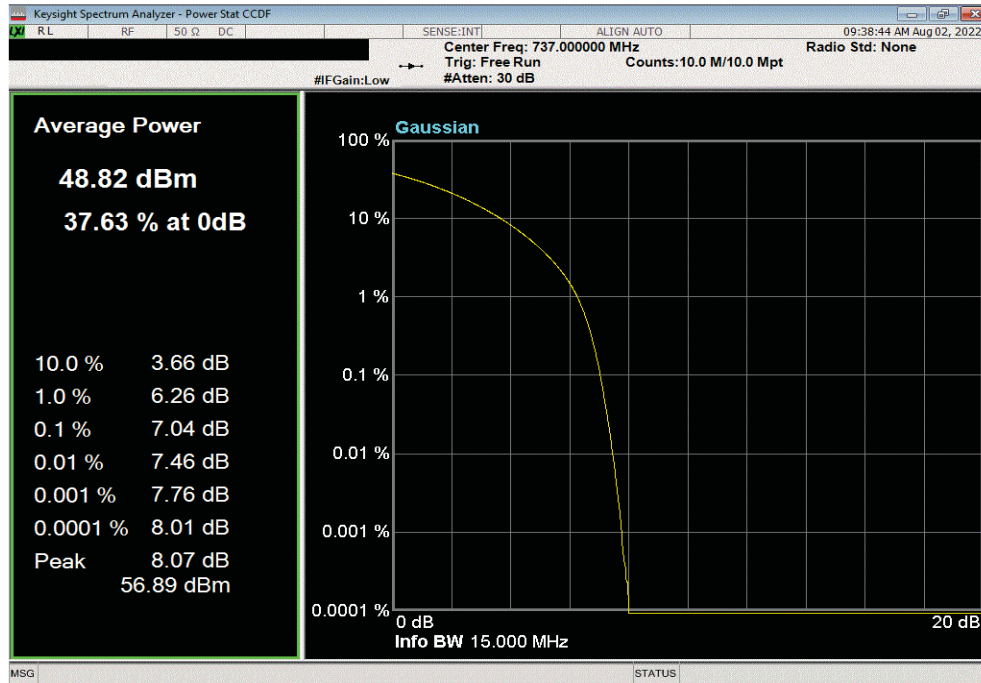


PEAK TO AVERAGE POWER (PAPR) CCDF - BAND n12

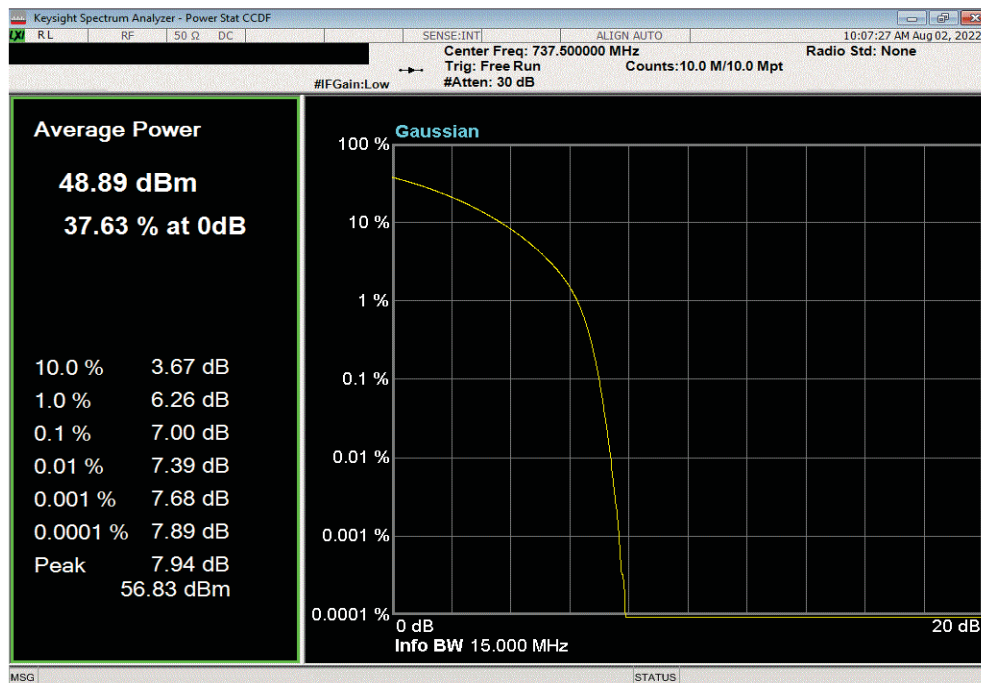


TbTtx 2022.05.02.0 XMit 2022.02.07.0

Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, Mid Channel, 737.0 MHz						
	Value	Limit	Results			
	(dB)	< (dB)				
	7.04	13	Pass			



Port 2, Band n12, 729 - 745 Mhz, 15 MHz Bandwidth, 256QAM Modulation, High Channel, 737.5 MHz						
	Value	Limit	Results			
	(dB)	< (dB)				
	7	13	Pass			



PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



XMH 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
Block - DC	Fairview Microwave	SD3239	ANE	2022-03-02	2023-03-02
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17
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.

Because the conducted Output Power was measured using a RMS Average detector, the Peak to Average Power Ratio (PAPR) was measured to show that the maximum peak-max-hold spectrum to the maximum of the average spectrum does not exceed 13 dB.

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

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

AHLBBA antenna ports 1&4 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.

AHLBBA antenna ports 2&3 are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification testing) and antenna port 2 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TstTx 2022.05.02.0 XMit 2022.02.07.0

EUT: AHLBBA (C2PC/C3PC FCC/ISED)		Work Order: NOKI0047	
Serial Number: K9193514835		Date: 3-Aug-22	
Customer: Nokia Solutions and Networks		Temperature: 21.5 °C	
Attendees: Mitchell Hill		Humidity: 56.9% RH	
Project: None		Barometric Pres.: 1021 mbar	
Tested by: Marty Martin		Power: 54VDC	
Job Site: TX07			
TEST SPECIFICATIONS			
RSS 140 Issue 1: 2018		ANSI C63.26:2015	
FCC 90R:2022		ANSI C63.26:2015	
COMMENTS			
All measurement path losses were accounted for in the reference level offset including attenuators, cables, DC block and filter when in use. The carriers were enabled at maximum power.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	2	Signature <i>Marty Martin</i>	
		PAPR Value (dB)	PAPR Limit (dB)
			Results
Port 1			
Band n14, 758 - 768 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
Mid Channel, 763 MHz		7.68	13
			Pass
16QAM Modulation			
Mid Channel, 763 MHz		7.8	13
			Pass
64QAM Modulation			
Mid Channel, 763 MHz		7.67	13
			Pass
256QAM Modulation			
Low Channel, 760.5 MHz		7.67	13
			Pass
Mid Channel, 763 MHz		7.67	13
			Pass
High Channel, 765.5 MHz		7.78	13
			Pass
10 MHz Bandwidth			
256QAM Modulation			
Mid Channel, 763 MHz		7.86	13
			Pass
Port 2			
Band n14, 758 - 768 Mhz			
5 MHz Bandwidth			
QPSK Modulation			
Mid Channel, 763 MHz		6.76	13
			Pass
16QAM Modulation			
Mid Channel, 763 MHz		6.93	13
			Pass
64QAM Modulation			
Mid Channel, 763 MHz		6.75	13
			Pass
256QAM Modulation			
Low Channel, 760.5 MHz		6.71	13
			Pass
Mid Channel, 763 MHz		6.76	13
			Pass
High Channel, 765.5 MHz		7.04	13
			Pass
10 MHz Bandwidth			
256QAM Modulation			
Mid Channel, 763 MHz		7.33	13
			Pass

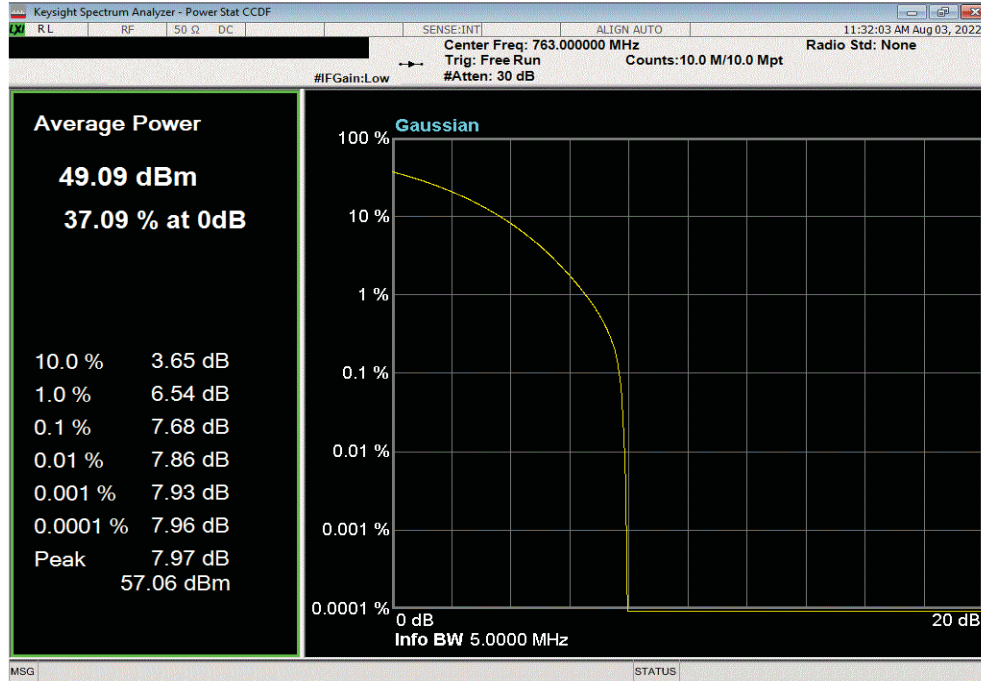
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTx 2022.05.02.0 XMit 2022.02.07.0

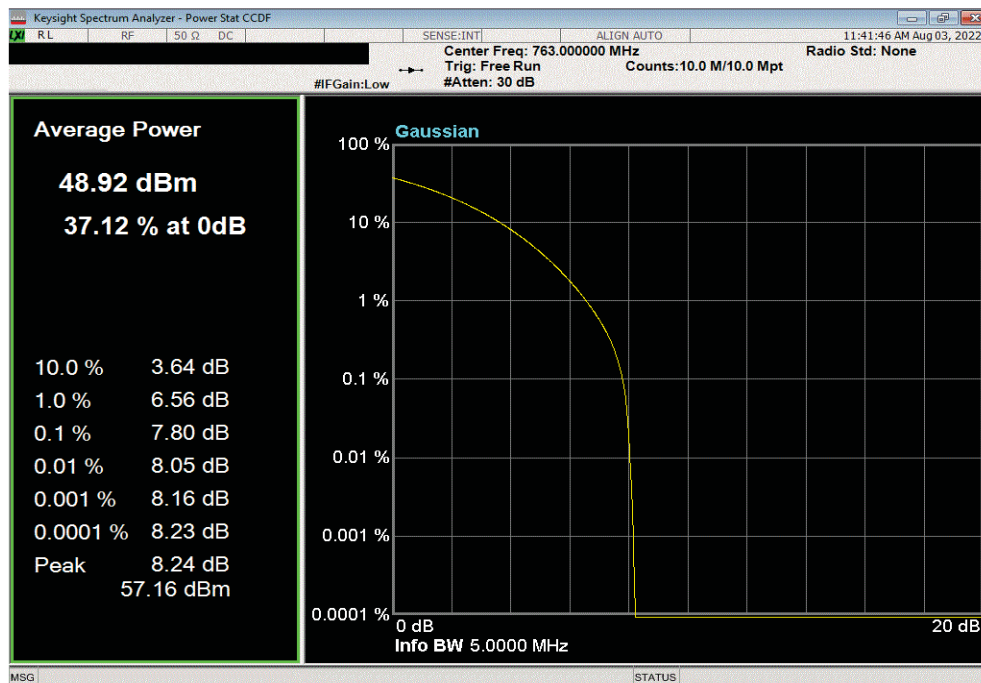
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.68	13	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.8	13	Pass



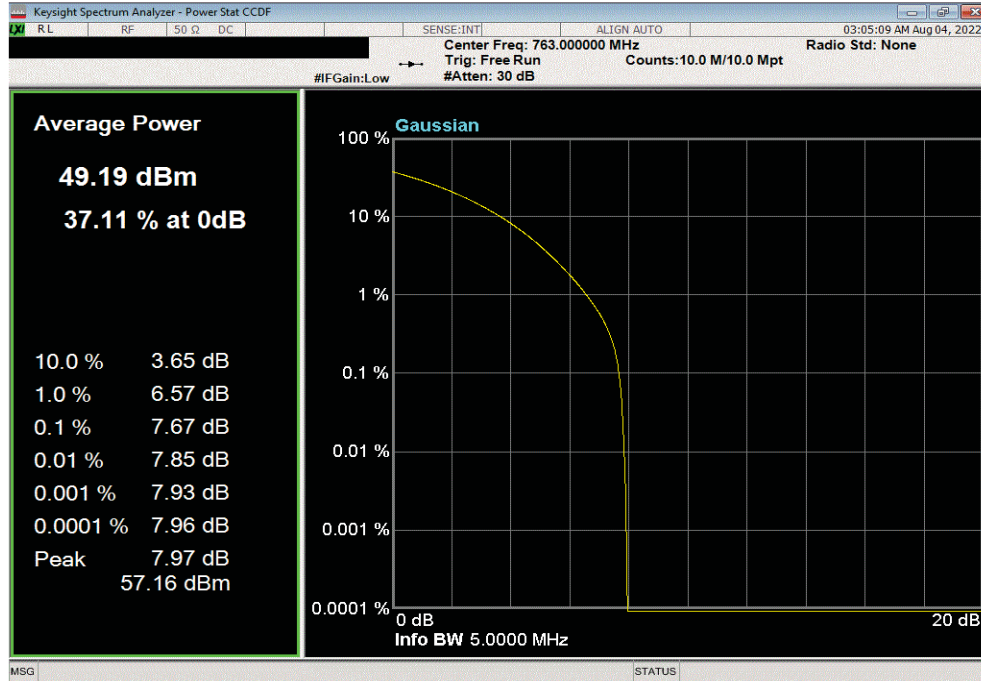
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTx 2022.05.02.0 XMit 2022.02.07.0

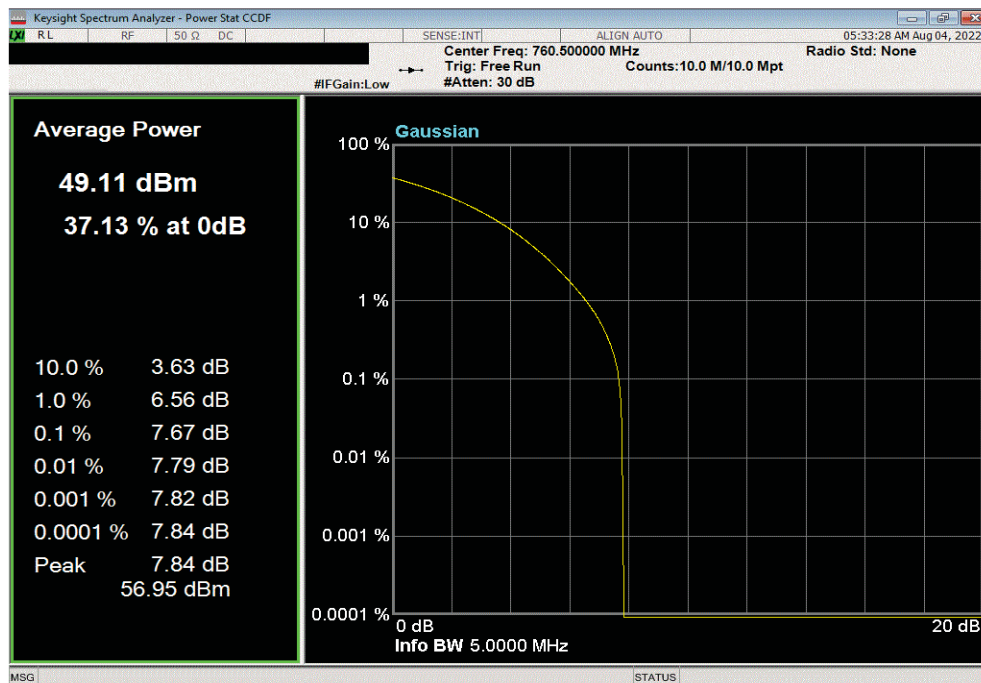
Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.67	13	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.67	13	Pass

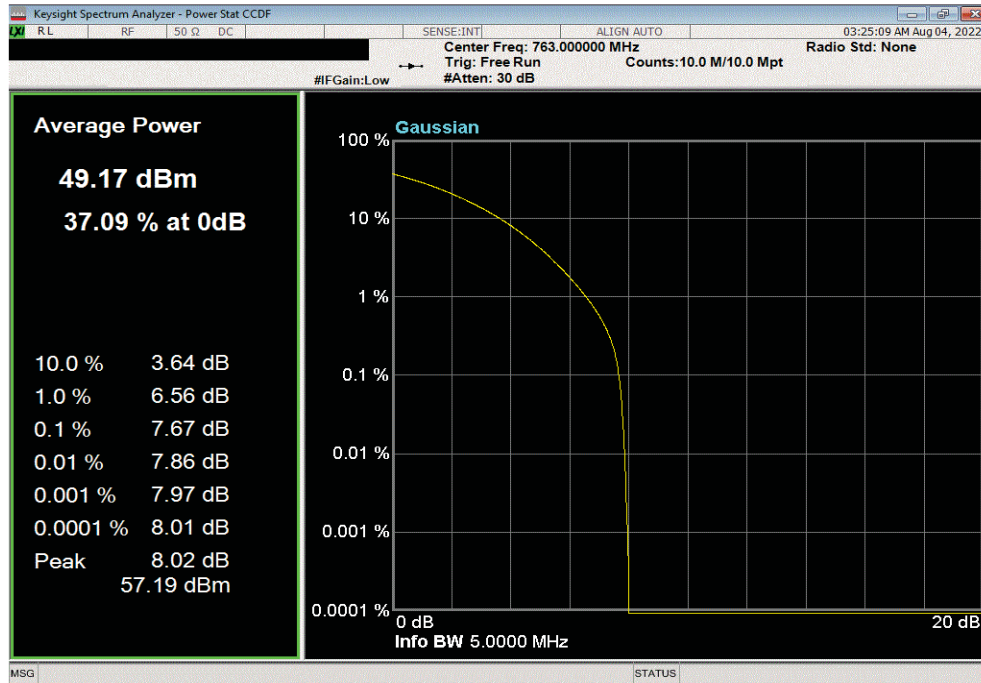


PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14

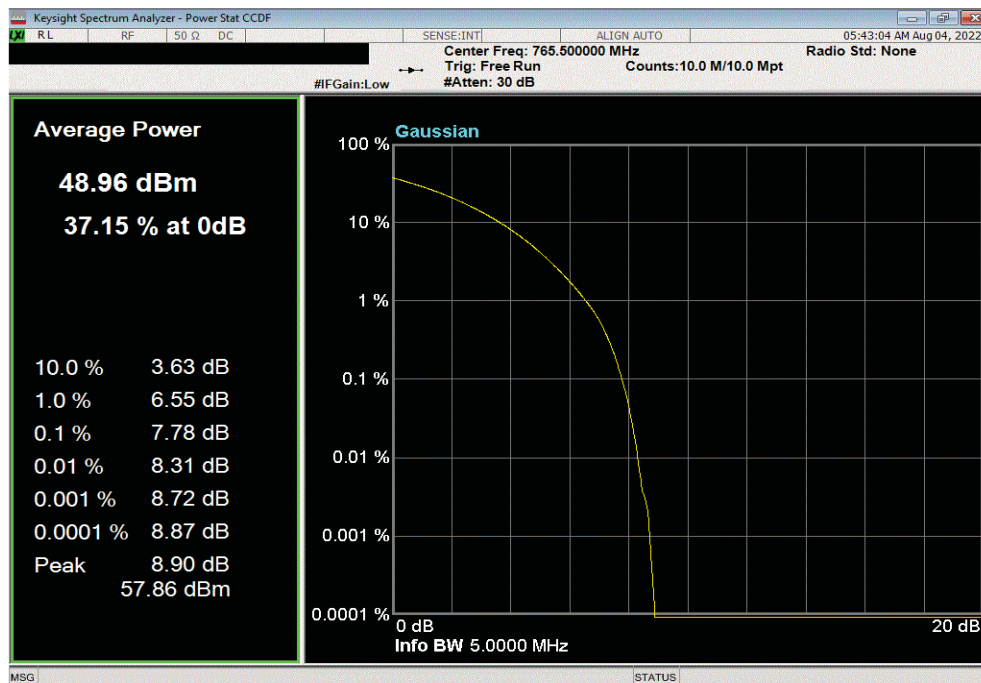


TbTx 2022.05.02.0 XMit 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.67	13	Pass



Port 1, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz						
				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.78	13	Pass



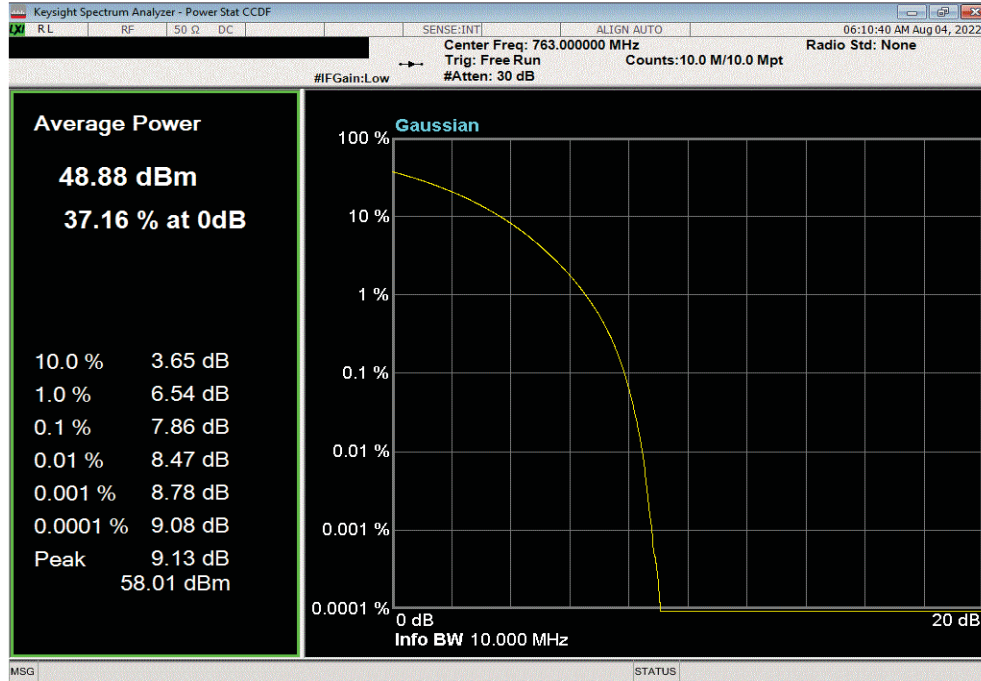
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTx 2022.05.02.0 XMit 2022.02.07.0

Port 1, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz

				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.86	13	Pass



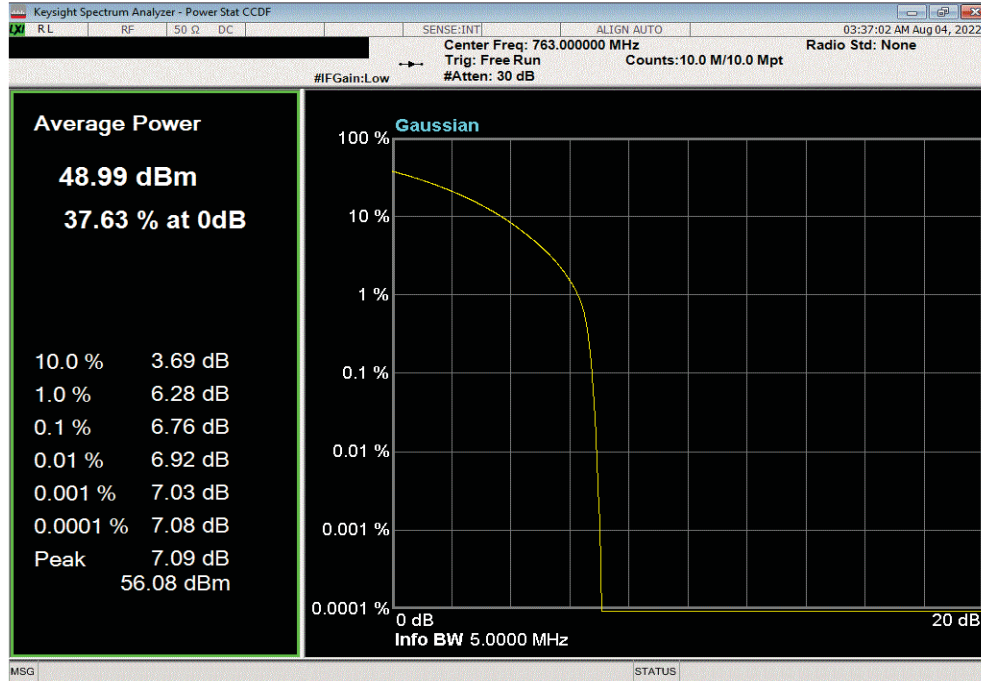
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTtx 2022.05.02.0 XMit 2022.02.07.0

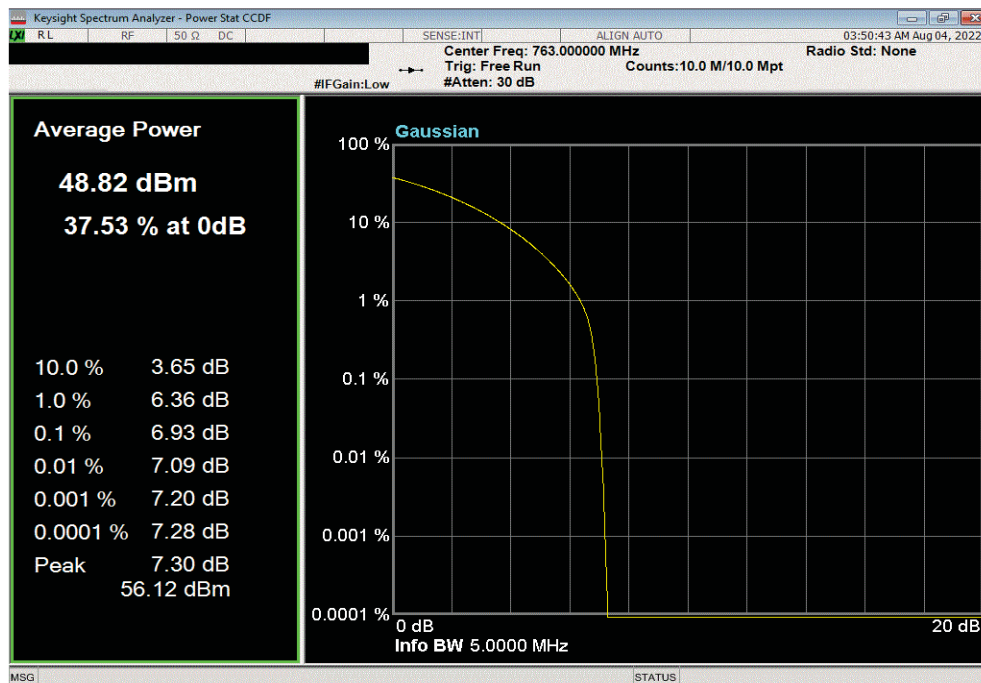
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, QPSK Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
6.76	13	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 16QAM Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
6.93	13	Pass



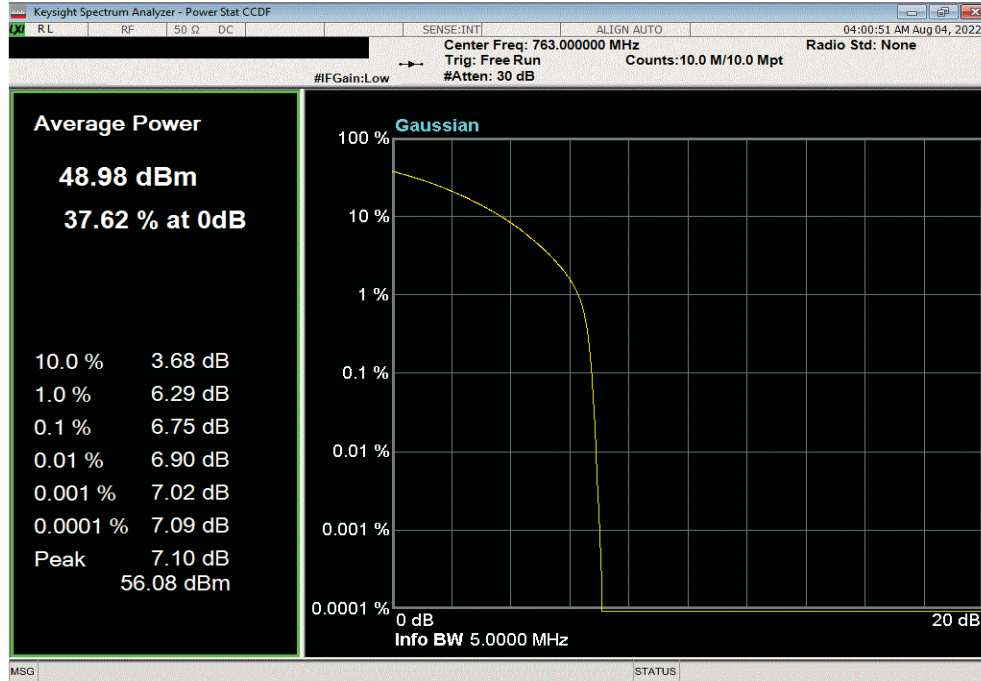
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTtx 2022.05.02.0 XMit 2022.02.07.0

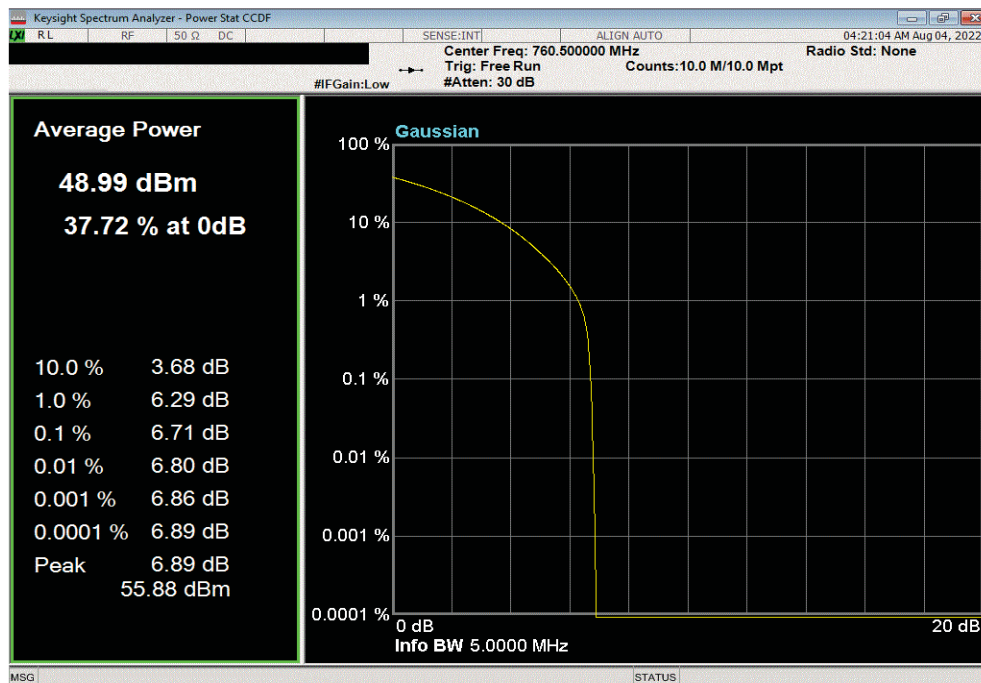
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 64QAM Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
6.75	13	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Low Channel, 760.5 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
6.71	13	Pass



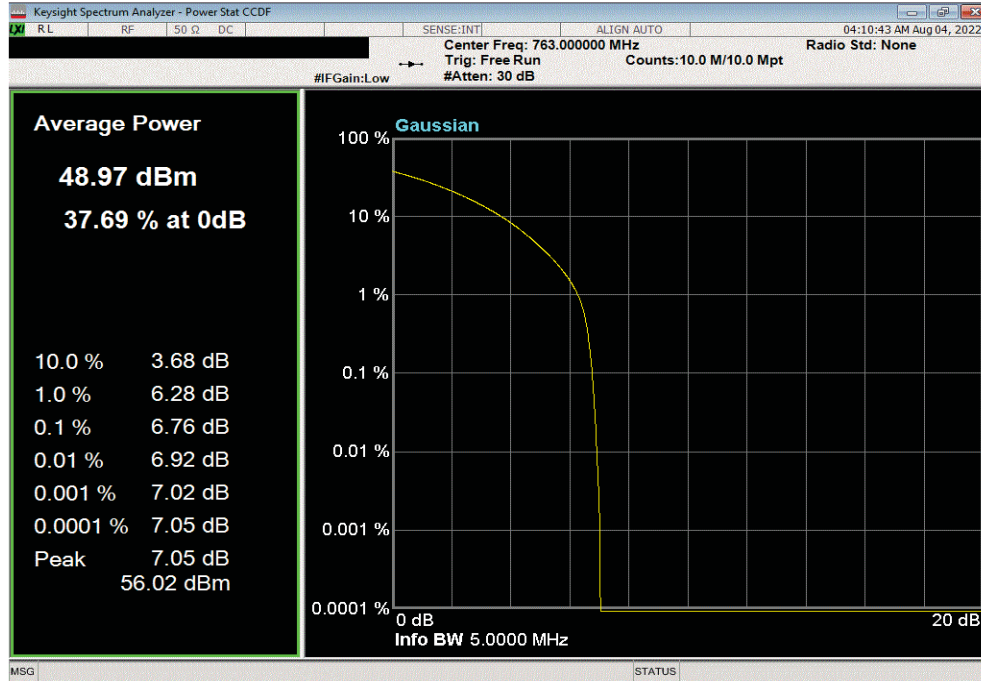
PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTtx 2022.05.02.0 XMit 2022.02.07.0

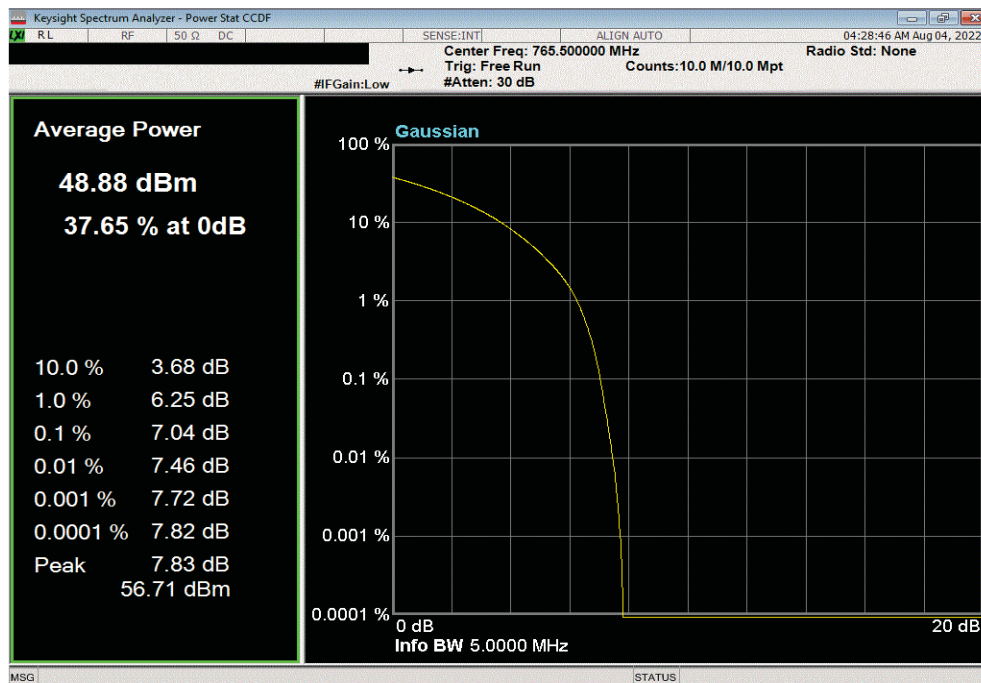
Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
6.76	13	Pass



Port 2, Band n14, 758 - 768 Mhz, 5 MHz Bandwidth, 256QAM Modulation, High Channel, 765.5 MHz

PAPR Value (dB)	PAPR Limit (dB)	Results
7.04	13	Pass



PEAK TO AVERAGE POWER (PAPR) CCDF BAND n14



TbTx 2022.05.02.0 XMit 2022.02.07.0

Port 2, Band n14, 758 - 768 Mhz, 10 MHz Bandwidth, 256QAM Modulation, Mid Channel, 763 MHz

				PAPR Value (dB)	PAPR Limit (dB)	Results
				7.33	13	Pass

