

OCCUPIED BANDWIDTH EMISSION MASK

BAND 66a



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

- RBW is 1% - 5% of the occupied bandwidth
- VBW is $\geq 3 \times$ the RBW
- Peak Detector was used
- Trace max hold was used

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.

FCC 27.53(h)(3) defines the 26dB emission bandwidth requirement.

RSS GEN Section 6.7 defines the 99% emission bandwidth requirement

Band 66a Emissions Designators:

Band 66a (2110MHz to 2180MHz) Emission Designators									
Channel Bandwidth	Radio Channel	5G-NR: QPSK		5G-NR: 16-QAM		5G-NR: 64-QAM		5G-NR: 256-QAM	
		FCC	IC	FCC	IC	FCC	IC	FCC	IC
5 MHz	Low	4M85G7W	4M49G7W	4M81G7W	4M50G7W	4M83G7W	4M47G7W	4M84G7W	4M49G7W
	Mid	4M85G7W	4M49G7W	4M80G7W	4M50G7W	4M85G7W	4M48G7W	4M83G7W	4M49G7W
	High	4M85G7W	4M49G7W	4M81G7W	4M50G7W	4M83G7W	4M48G7W	4M83G7W	4M49G7W
10 MHz	Low	9M90G7W	9M32G7W	9M84G7W	9M27G7W	9M89G7W	9M31G7W	9M90G7W	9M32G7W
	Mid	9M88G7W	9M33G7W	9M85G7W	9M27G7W	9M90G7W	9M31G7W	9M90G7W	9M31G7W
	High	9M91G7W	9M32G7W	9M84G7W	9M27G7W	9M88G7W	9M31G7W	9M90G7W	9M31G7W
15 MHz	Low	14M84G7W	14M10G7W	14M84G7W	14M15G7W	14M84G7W	14M17G7W	14M84G7W	14M11G7W
	Mid	14M84G7W	14M10G7W	14M82G7W	14M12G7W	14M85G7W	14M18G7W	14M85G7W	14M11G7W
	High	14M84G7W	14M9G7W	14M82G7W	14M14G7W	14M83G7W	14M17G7W	14M85G7W	14M12G7W
20 MHz	Low	19M94G7W	18M92G7W	19M86G7W	18M99G7W	19M96G7W	18M94G7W	19M92G7W	18M95G7W
	Mid	19M95G7W	18M92G7W	19M85G7W	18M99G7W	19M97G7W	18M95G7W	19M94G7W	18M95G7W
	High	19M97G7W	18M92G7W	19M85G7W	18M99G7W	19M95G7W	18M94G7W	19M92G7W	18M93G7W

Note: FCC based on 26db emission bandwidth; IC based on 99% emission bandwidth

OCCUPIED BANDWIDTH EMISSION MASK BAND 66a



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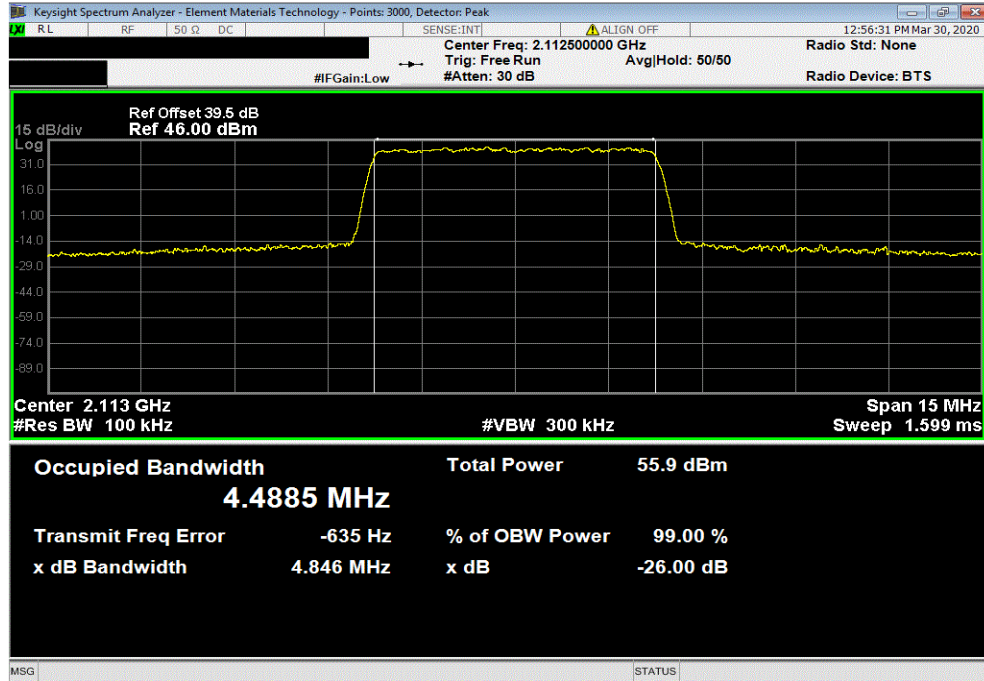
EUT: AHFC		Work Order: NOKI0007			
Serial Number: K9180317594		Date: 6-Apr-20			
Customer: Nokia Solutions and Networks		Temperature: 23.1 °C			
Attendees: Mitch Hill, John Rattanaovong		Humidity: 47.4% RH			
Project: None		Barometric Pres.: 1013 mbar			
Tested by: Brandon Hobbs		Power: 54 VDC	Job Site: TX03		
TEST SPECIFICATIONS		Test Method			
FCC 27:2020		ANSI C63.26:2015			
RSS-Gen:2019		RSS-Gen:2019			
COMMENTS					
All measurement path losses were accounted for in the reference level offset including any attenuators, filters and DC blocks. The hottest port was used for testing. The worst case port was determined in the original client test report. The carrier power was set to maximum for all testing.					
DEVIATIONS FROM TEST STANDARD					
None					
Configuration #	2	Signature 			
		Value 99% (MHz)	Value 26dB (MHz)	Limit	Result
Band 66a, 2110 MHz - 2180 MHz, 5G					
Port 3					
5 MHz Bandwidth					
QPSK Modulation					
Low Channel, 2112.5 MHz		4.49	4.85	Within Band	Pass
Mid Channel, 2145 MHz		4.49	4.85	Within Band	Pass
High Channel, 2177.5 MHz		4.49	4.85	Within Band	Pass
16-QAM Modulation					
Low Channel, 2112.5 MHz		4.50	4.81	Within Band	Pass
Mid Channel, 2145 MHz		4.50	4.80	Within Band	Pass
High Channel, 2177.5 MHz		4.50	4.81	Within Band	Pass
64-QAM Modulation					
Low Channel, 2112.5 MHz		4.47	4.83	Within Band	Pass
Mid Channel, 2145 MHz		4.48	4.85	Within Band	Pass
High Channel, 2177.5 MHz		4.48	4.83	Within Band	Pass
256-QAM Modulation					
Low Channel, 2112.5 MHz		4.49	4.84	Within Band	Pass
Mid Channel, 2145 MHz		4.49	4.83	Within Band	Pass
High Channel, 2177.5 MHz		4.49	4.83	Within Band	Pass
10 MHz Bandwidth					
QPSK Modulation					
Low Channel, 2115.0 MHz		9.32	9.90	Within Band	Pass
Mid Channel, 2145 MHz		9.33	9.88	Within Band	Pass
High Channel, 2175 MHz		9.32	9.91	Within Band	Pass
16-QAM Modulation					
Low Channel, 2115.0 MHz		9.27	9.84	Within Band	Pass
Mid Channel, 2145 MHz		9.27	9.85	Within Band	Pass
High Channel, 2175 MHz		9.27	9.84	Within Band	Pass
64-QAM Modulation					
Low Channel, 2115.0 MHz		9.31	9.89	Within Band	Pass
Mid Channel, 2145 MHz		9.31	9.90	Within Band	Pass
High Channel, 2175 MHz		9.31	9.88	Within Band	Pass
256-QAM Modulation					
Low Channel, 2115.0 MHz		9.32	9.90	Within Band	Pass
Mid Channel, 2145 MHz		9.31	9.90	Within Band	Pass
High Channel, 2175 MHz		9.31	9.90	Within Band	Pass
15 MHz Bandwidth					
QPSK Modulation					
Low Channel, 2117.5 MHz		14.10	14.83	Within Band	Pass
Mid Channel, 2145 MHz		14.10	14.83	Within Band	Pass
High Channel, 2172.5 MHz		14.09	14.83	Within Band	Pass
16-QAM Modulation					
Low Channel, 2117.5 MHz		14.15	14.82	Within Band	Pass
Mid Channel, 2145 MHz		14.12	14.82	Within Band	Pass
High Channel, 2172.5 MHz		14.14	14.84	Within Band	Pass
64-QAM Modulation					
Low Channel, 2117.5 MHz		14.17	14.84	Within Band	Pass
Mid Channel, 2145 MHz		14.18	14.85	Within Band	Pass
High Channel, 2172.5 MHz		14.17	14.83	Within Band	Pass
256-QAM Modulation					
Low Channel, 2117.5 MHz		14.11	14.84	Within Band	Pass
Mid Channel, 2145 MHz		14.11	14.85	Within Band	Pass
High Channel, 2172.5 MHz		14.12	14.85	Within Band	Pass
20 MHz Bandwidth					
QPSK Modulation					
Low Channel, 2120 MHz		18.92	19.94	Within Band	Pass
Mid Channel, 2145 MHz		18.92	19.95	Within Band	Pass
High Channel, 2170 MHz		18.92	19.97	Within Band	Pass
16-QAM Modulation					
Low Channel, 2120 MHz		18.99	19.86	Within Band	Pass
Mid Channel, 2145 MHz		18.99	19.85	Within Band	Pass
High Channel, 2170 MHz		18.99	19.85	Within Band	Pass
64-QAM Modulation					
Low Channel, 2120 MHz		18.94	19.96	Within Band	Pass
Mid Channel, 2145 MHz		18.95	19.97	Within Band	Pass
High Channel, 2170 MHz		18.94	19.95	Within Band	Pass
256-QAM Modulation					
Low Channel, 2120 MHz		18.95	19.92	Within Band	Pass
Mid Channel, 2145 MHz		18.95	19.94	Within Band	Pass
High Channel, 2170 MHz		18.93	19.92	Within Band	Pass

OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

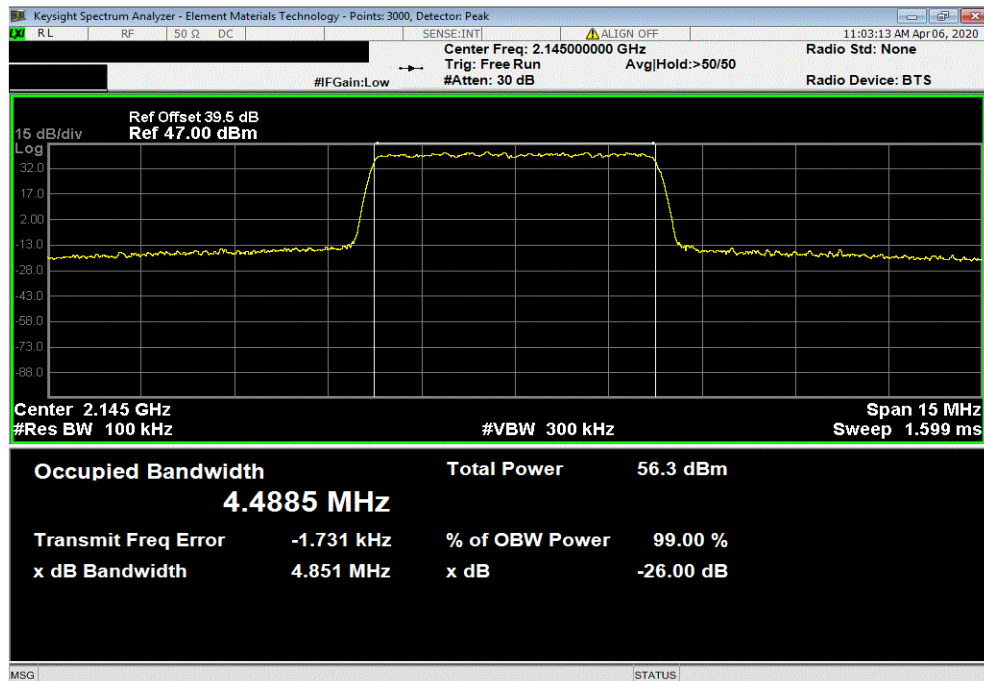


TbTtX 2019.08.30.0 XMtX 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, QPSK Modulation , Low Channel, 2112.5 MHz							
			Value	Value	Limit	Result	
			99% (MHz)	26dB (MHz)			
			4.489	4.846	Within Band	Pass	



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, QPSK Modulation , Mid Channel, 2145 MHz							
			Value	Value	Limit	Result	
			99% (MHz)	26dB (MHz)			
			4.488	4.851	Within Band	Pass	

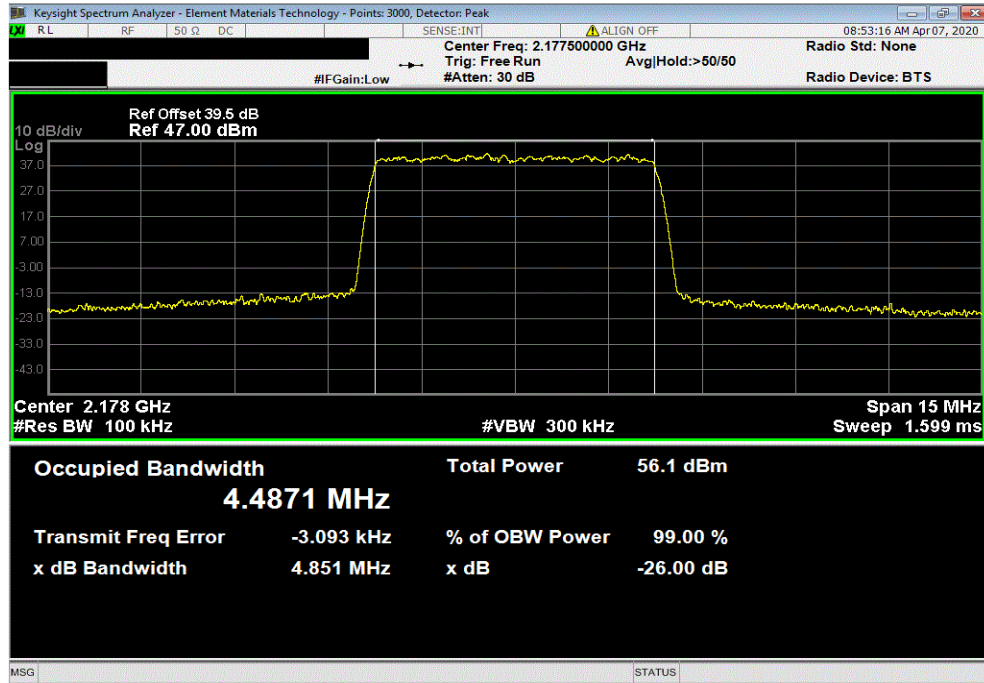


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

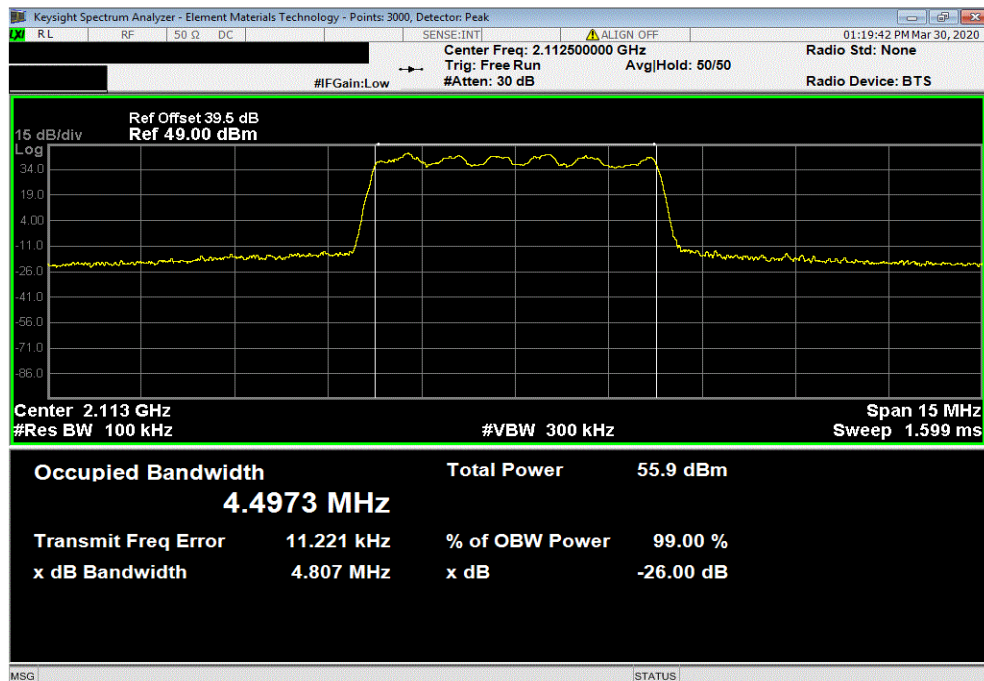


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, QPSK Modulation , High Channel, 2177.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.487	4.851	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 16-QAM Modulation, Low Channel, 2112.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.497	4.807	Within Band	Pass		

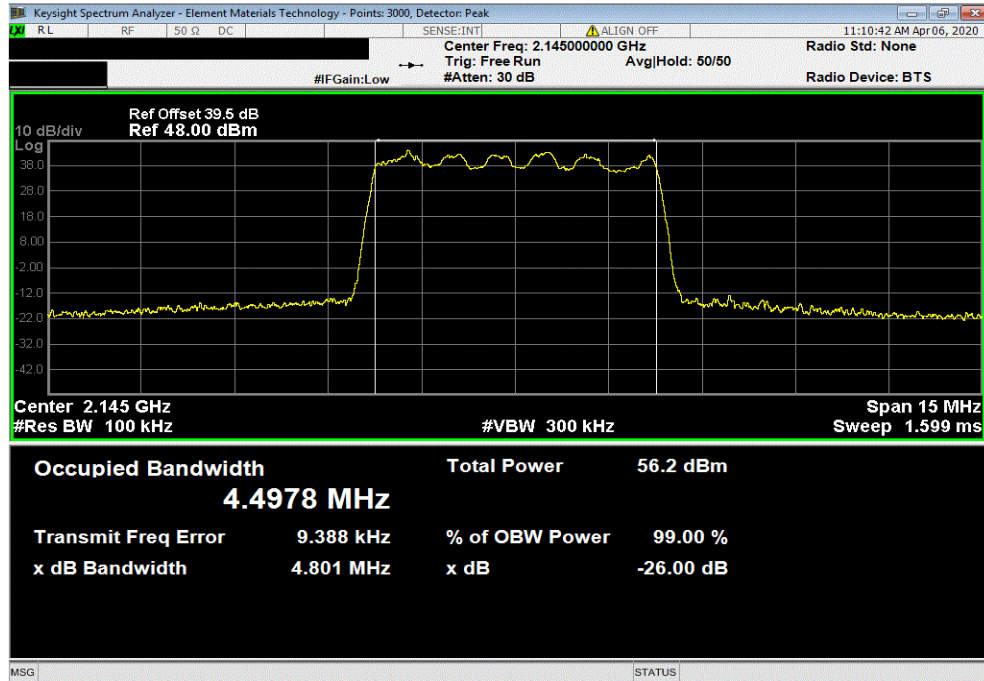


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

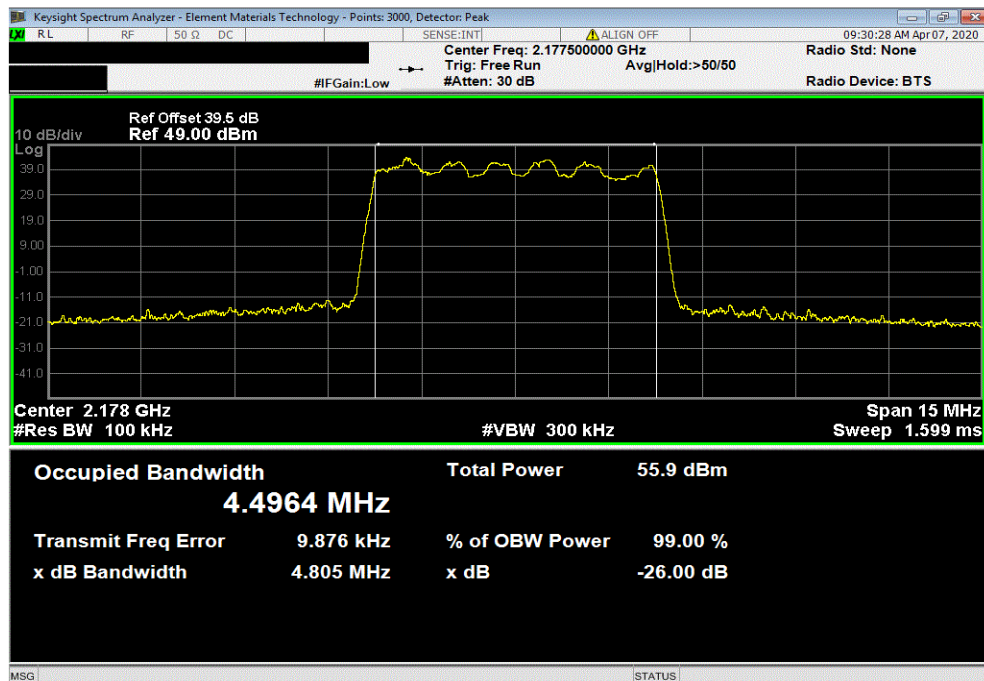


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.498	4.801	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 16-QAM Modulation, High Channel, 2177.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.496	4.805	Within Band	Pass		

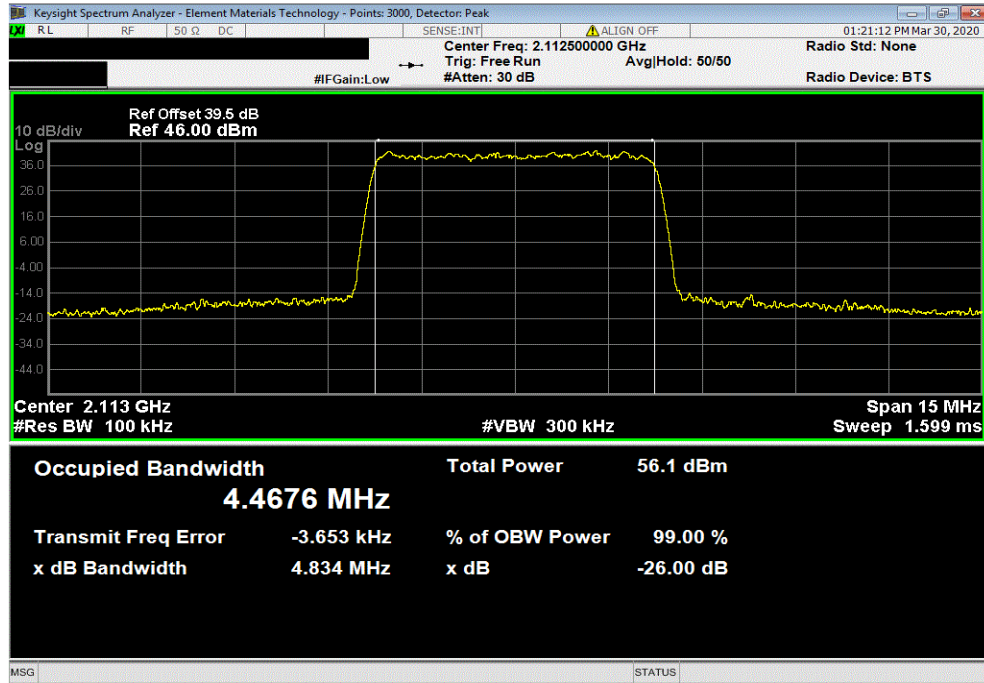


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

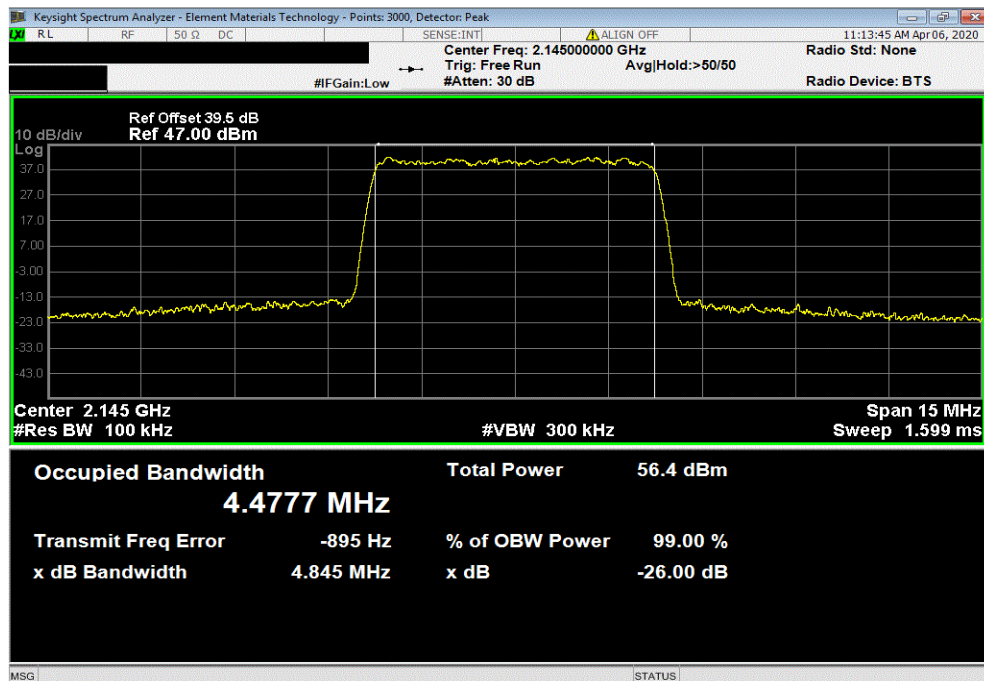


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 64-QAM Modulation, Low Channel, 2112.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.468	4.834	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.478	4.845	Within Band	Pass		

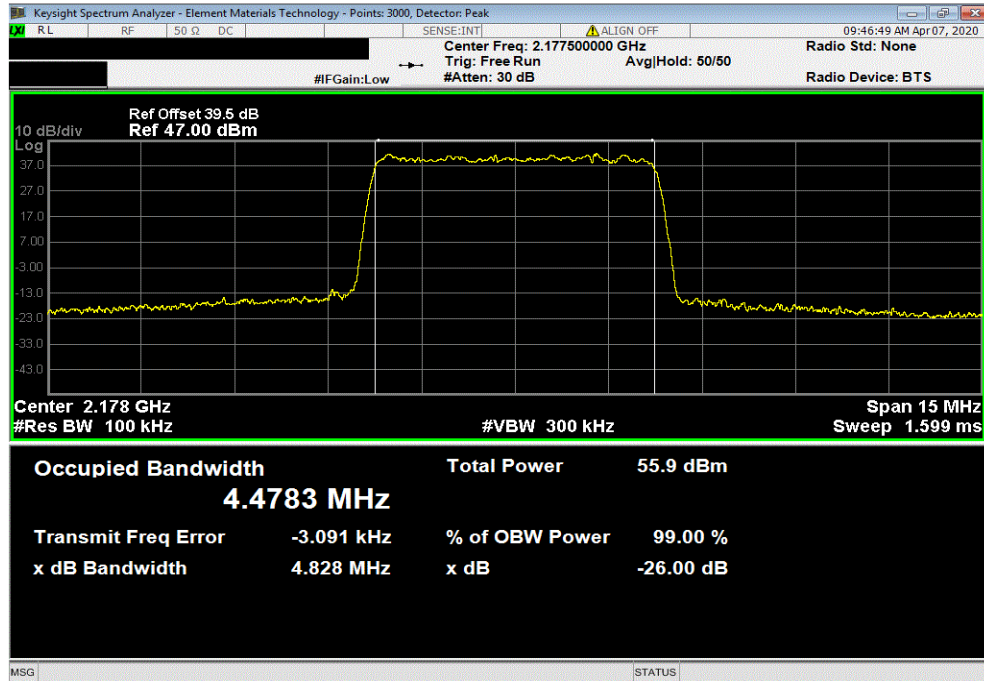


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

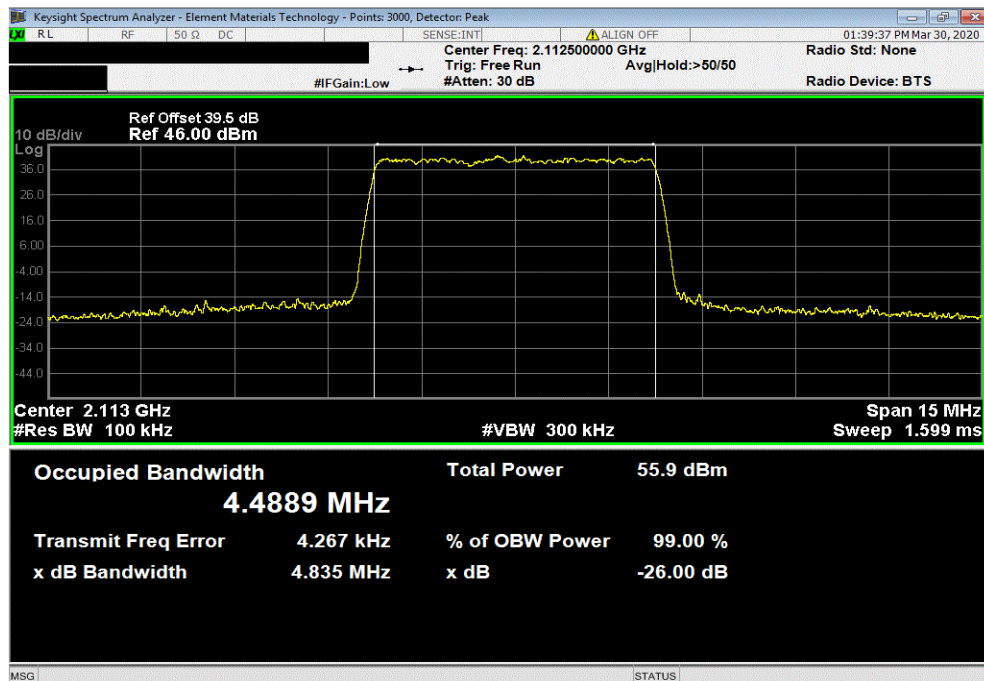


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 64-QAM Modulation, High Channel, 2177.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.478	4.828	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Low Channel, 2112.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.489	4.835	Within Band	Pass		

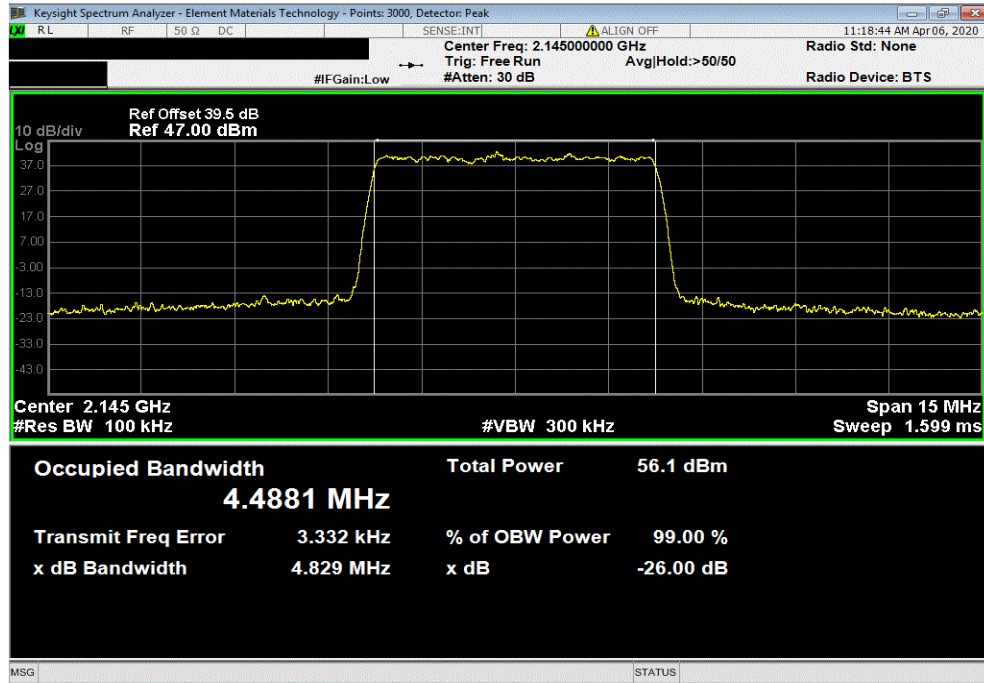


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

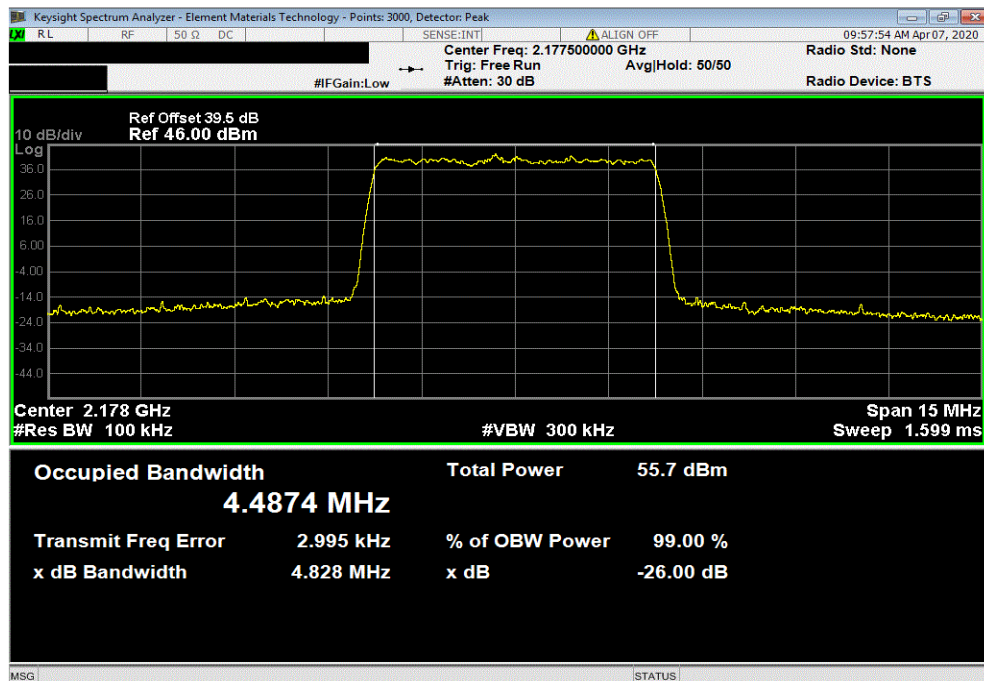


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.488	4.829	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 5 MHz Bandwidth, 256-QAM Modulation, High Channel, 2177.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	4.487	4.828	Within Band	Pass		

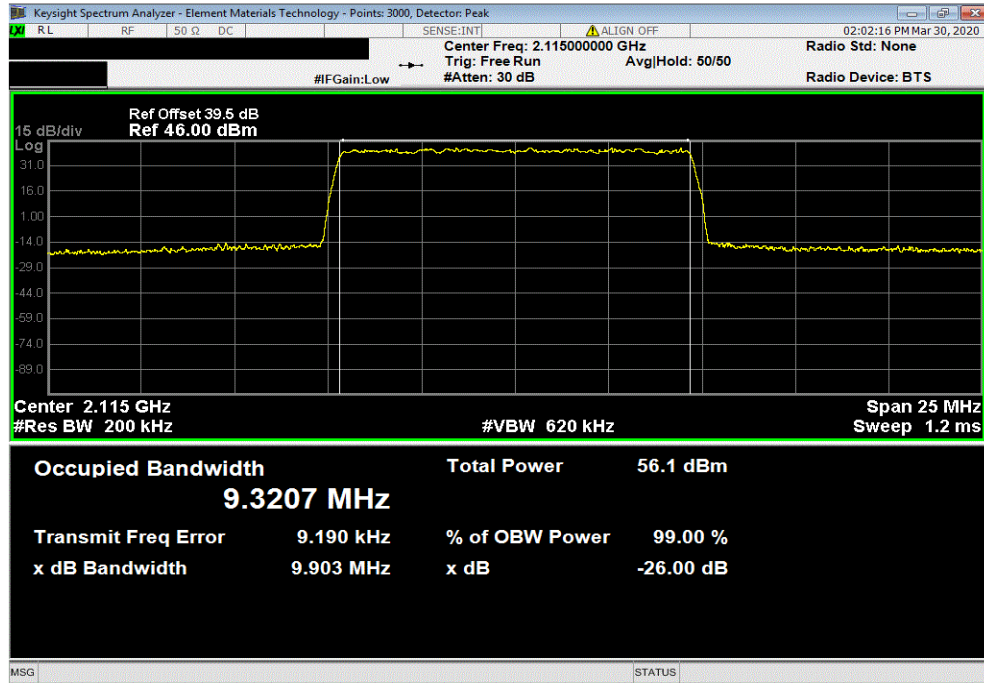


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

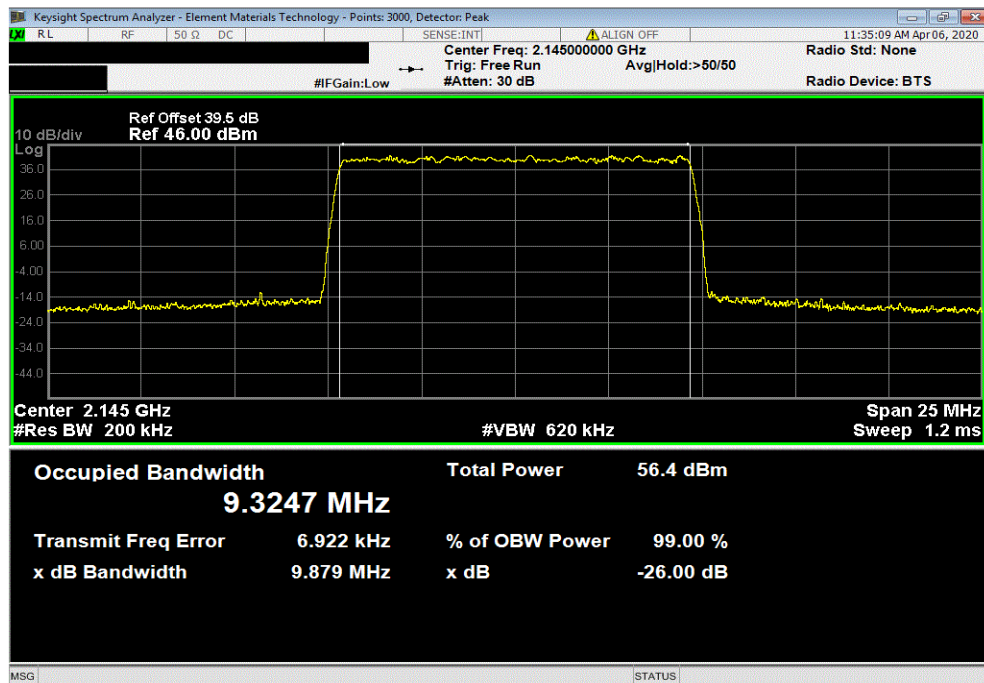


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, QPSK Modulation, Low Channel, 2115.0 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	9.321	9.903		Within Band	Pass	



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, QPSK Modulation, Mid Channel, 2145 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	9.325	9.879		Within Band	Pass	

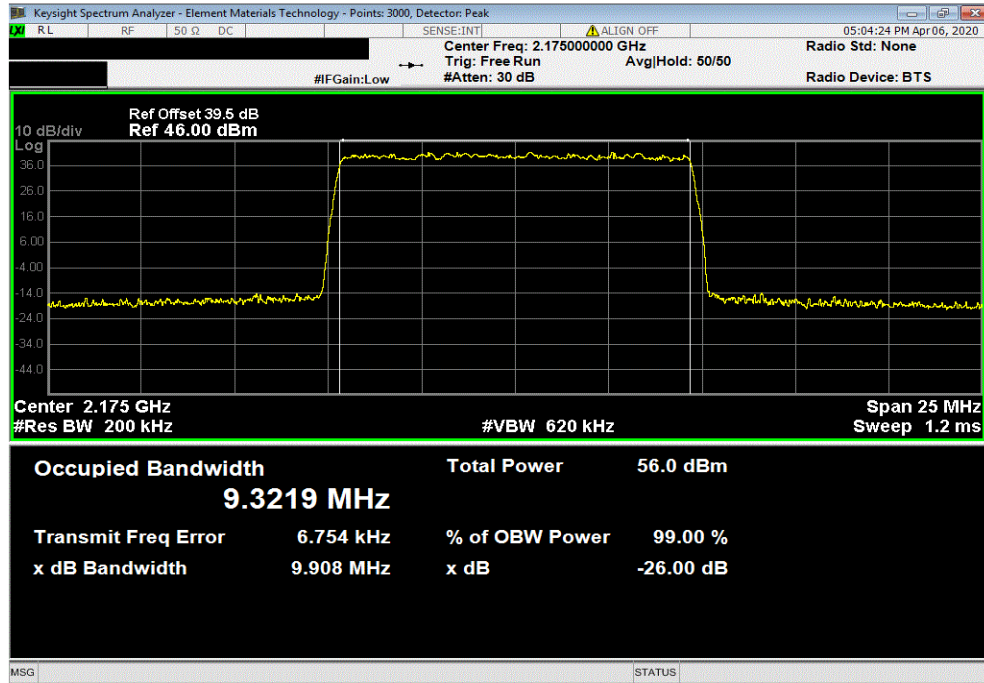


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

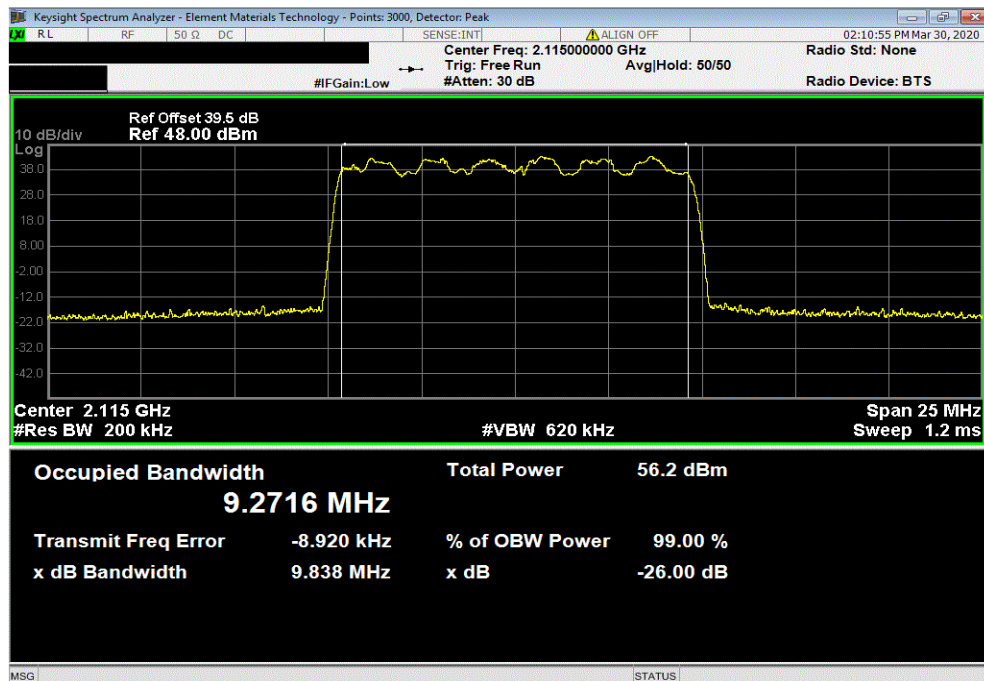


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, QPSK Modulation , High Channel, 2175 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	9.322	9.908	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 16-QAM Modulation, Low Channel, 2115.0 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	9.272	9.838	Within Band	Pass		

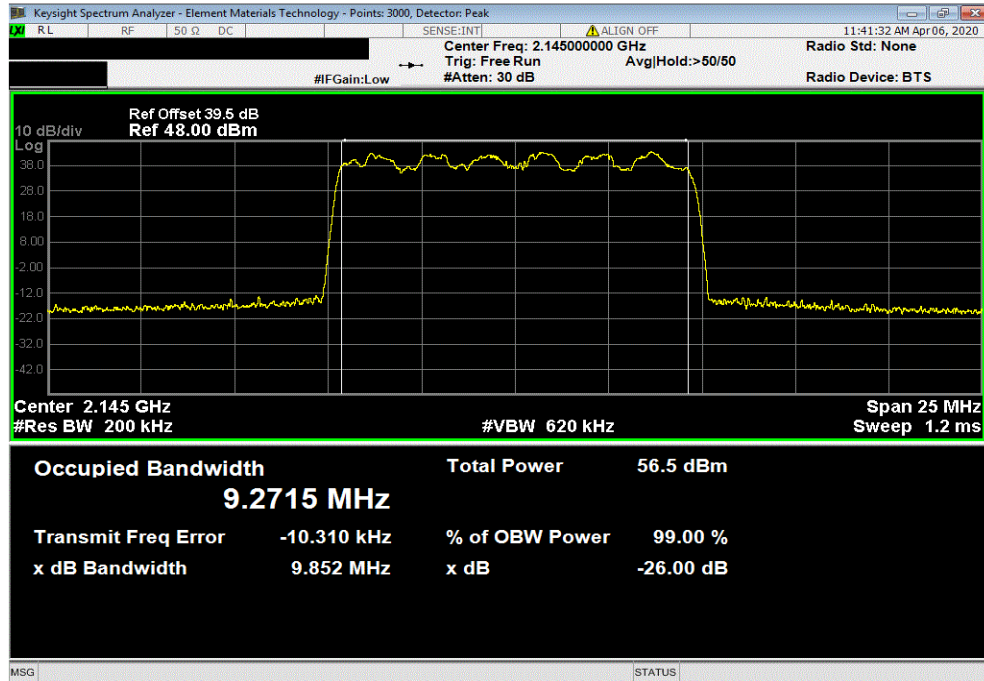


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

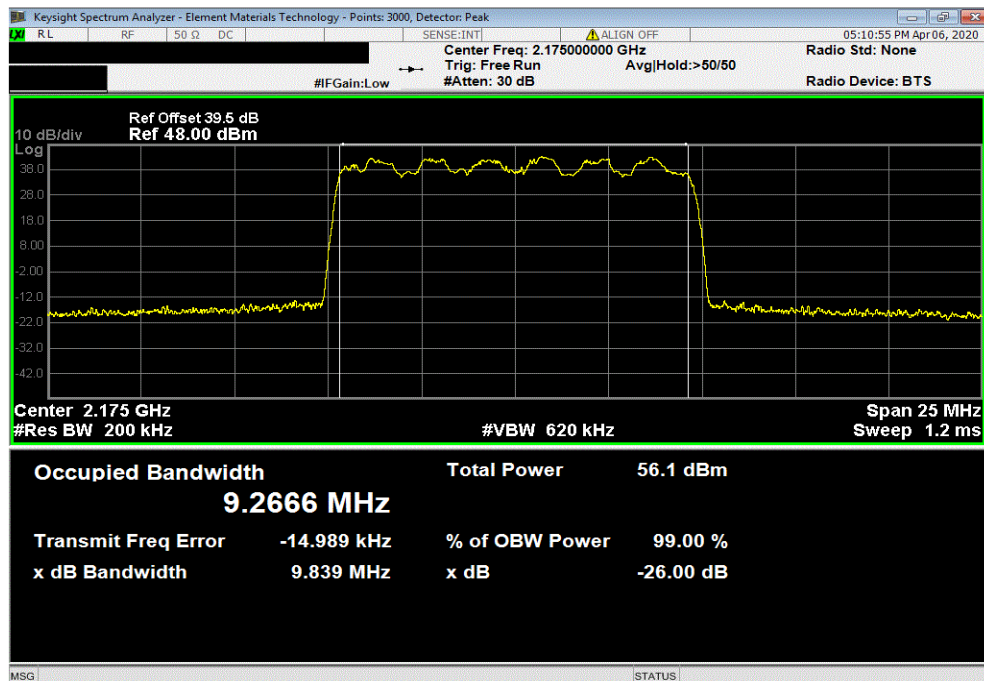


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	9.271	9.852	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 16-QAM Modulation, High Channel, 2175 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	9.267	9.839	Within Band	Pass		

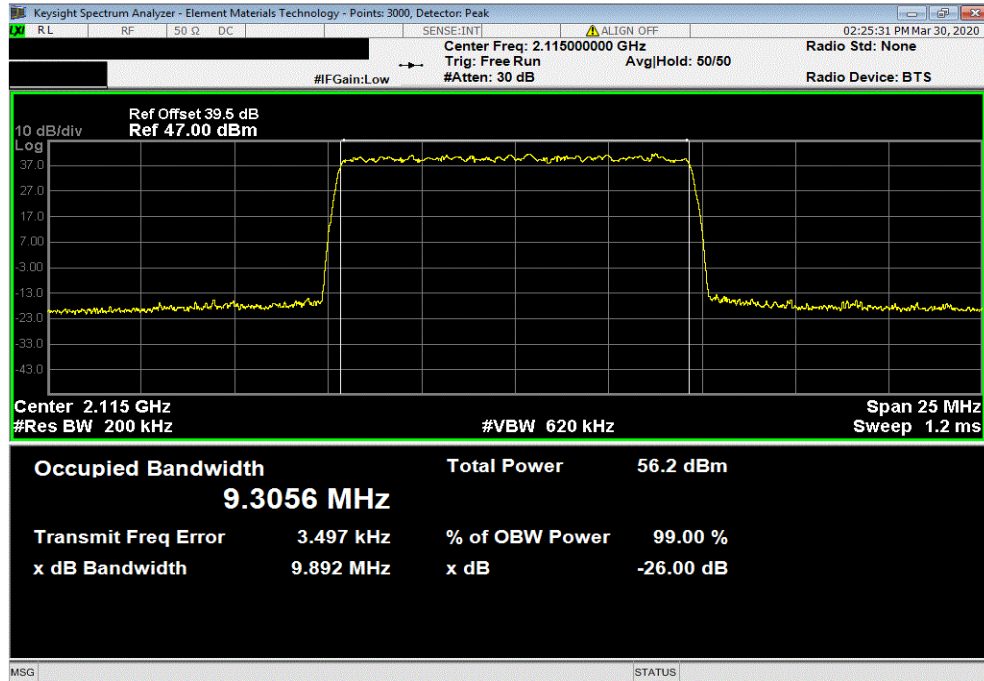


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

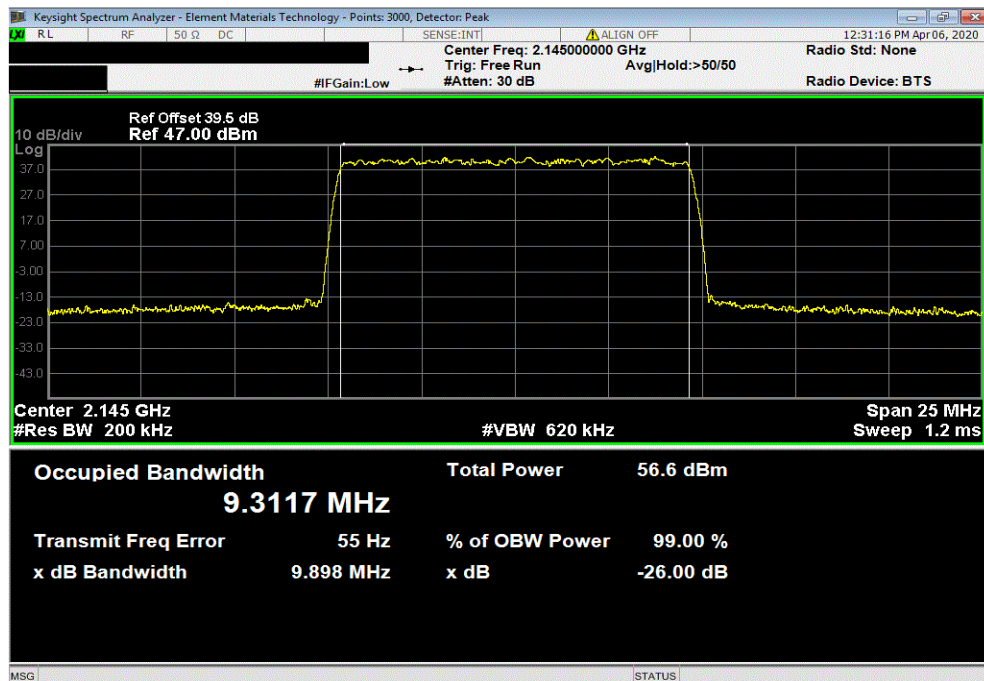


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 64-QAM Modulation, Low Channel, 2115.0 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	9.306	9.892	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	9.312	9.898	Within Band	Pass		

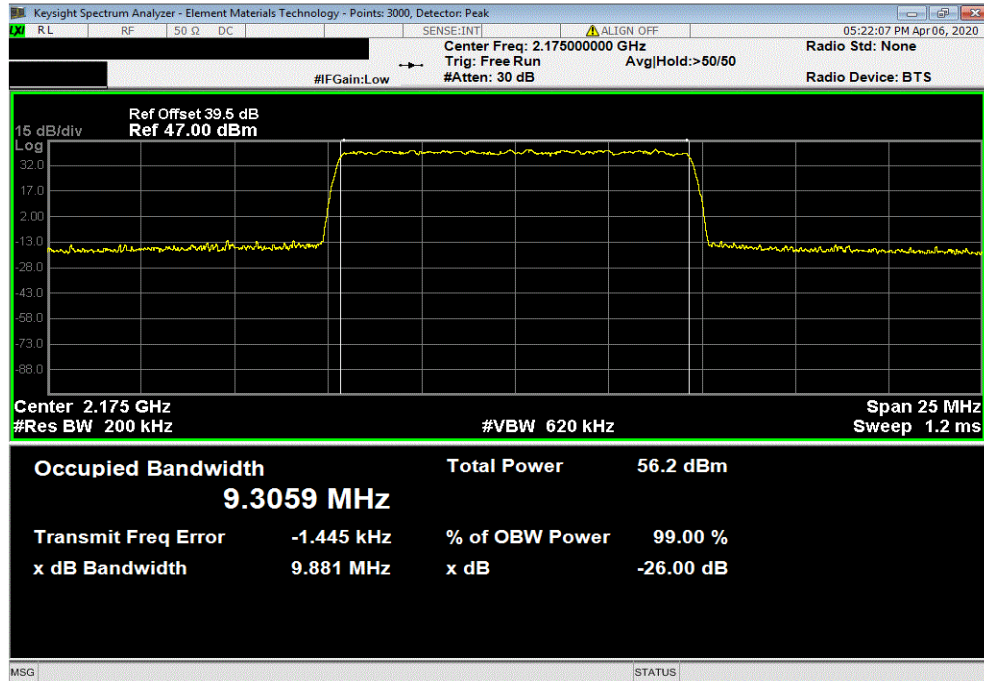


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

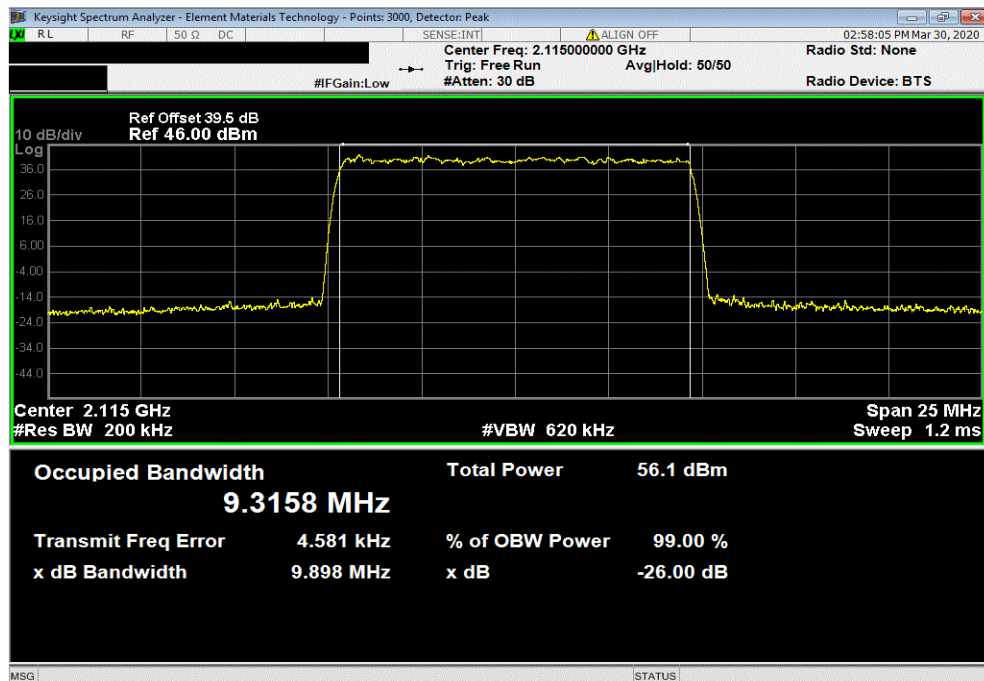


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 64-QAM Modulation, High Channel, 2175 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	9.306	9.881		Within Band	Pass	



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 256-QAM Modulation, Low Channel, 2115.0 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	9.316	9.898		Within Band	Pass	

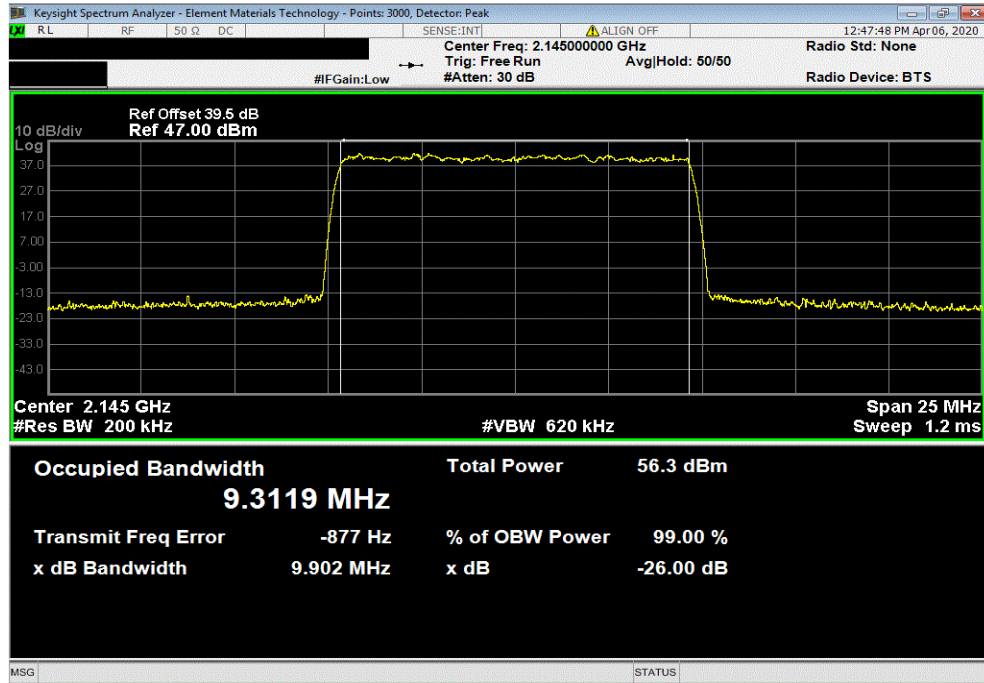


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

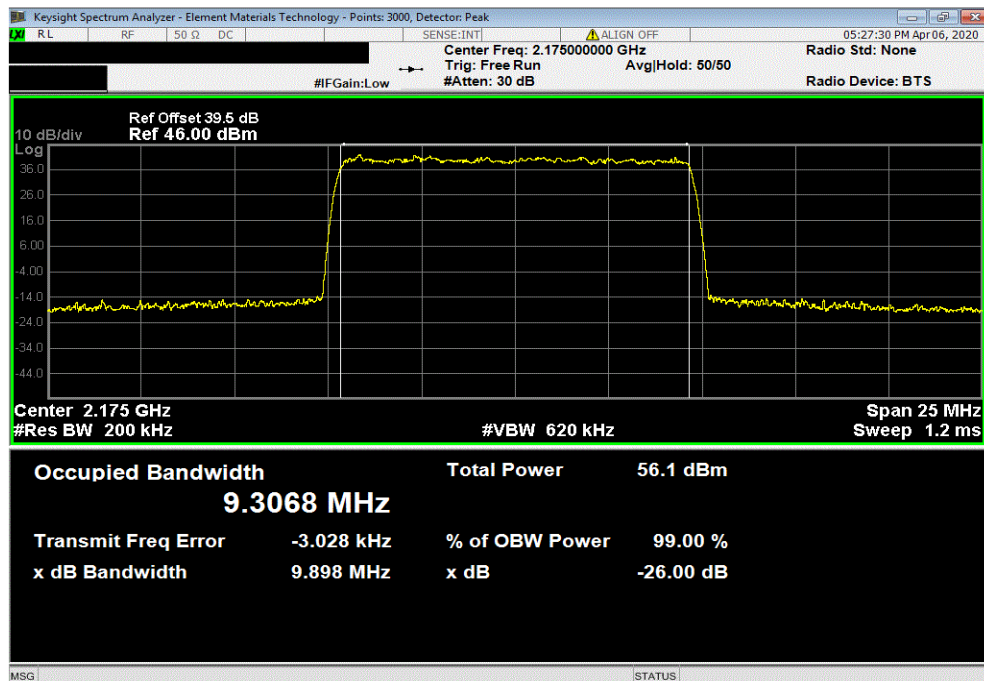


TbTx 2019.08.30.0 XbM 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	9.312	9.902	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 10 MHz Bandwidth, 256-QAM Modulation, High Channel, 2175 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	9.307	9.898	Within Band	Pass		

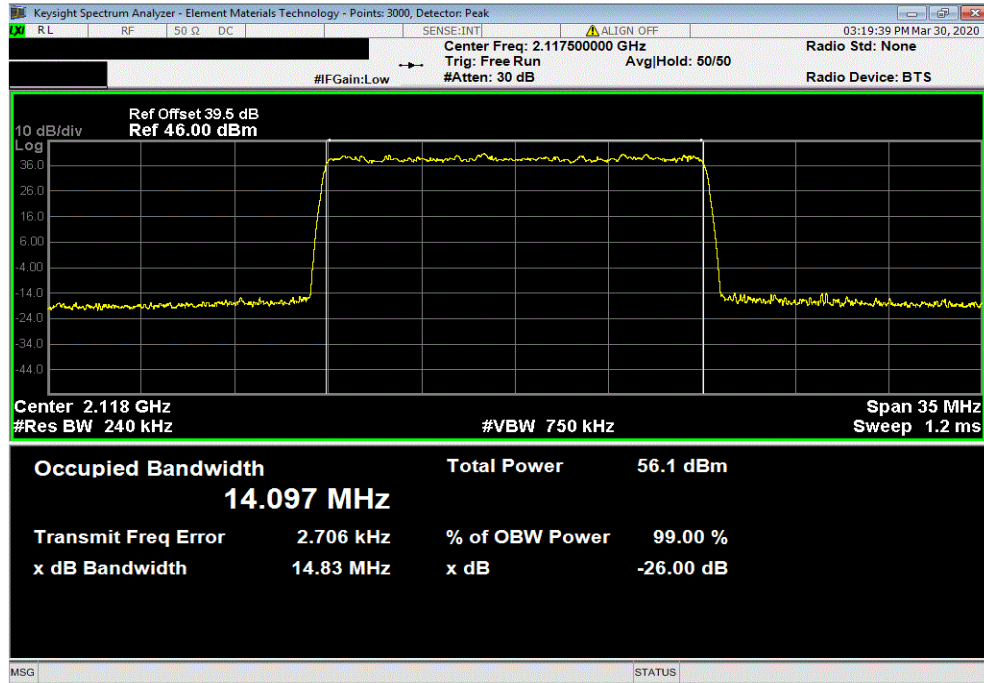


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

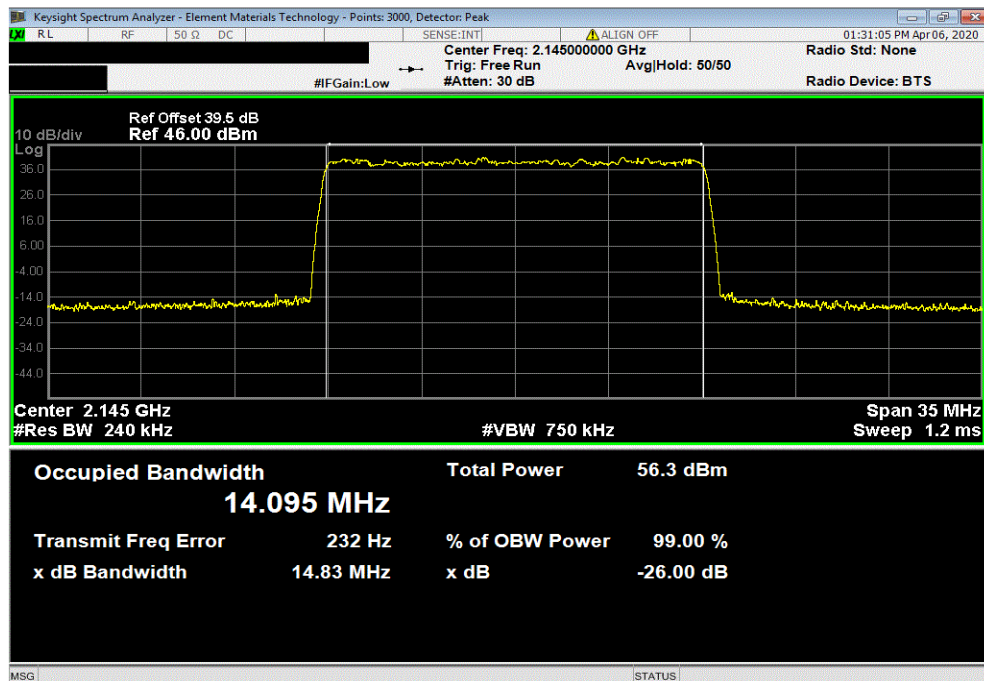


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, QPSK Modulation, Low Channel, 2117.5 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	14.097	14.829		Within Band	Pass	



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, QPSK Modulation, Mid Channel, 2145 MHz						
	Value	Value		Limit	Result	
	99% (MHz)	26dB (MHz)				
	14.095	14.83		Within Band	Pass	

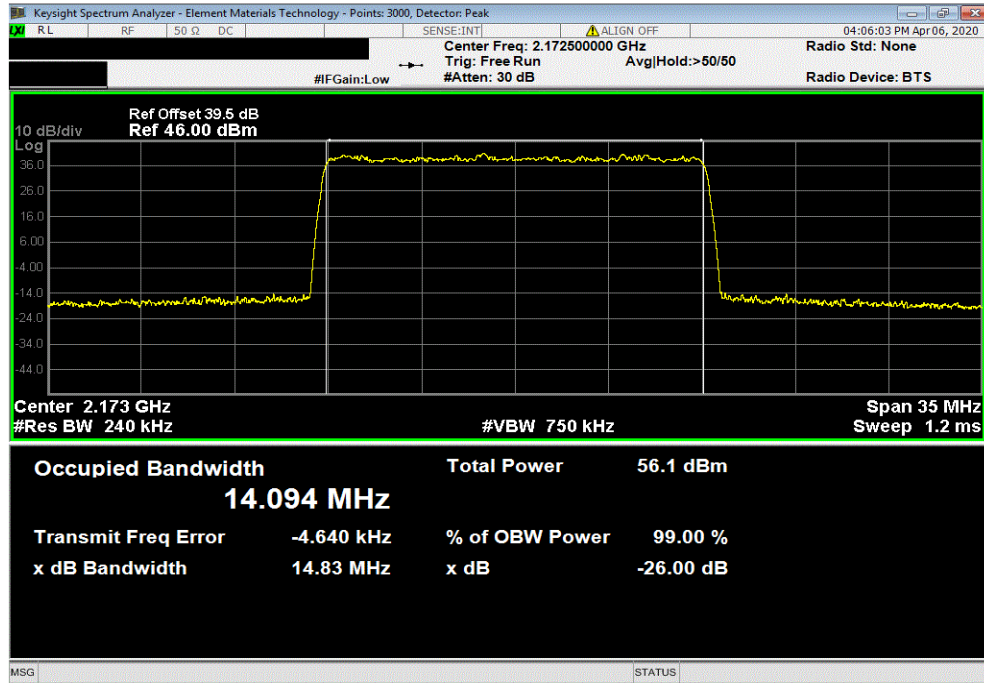


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

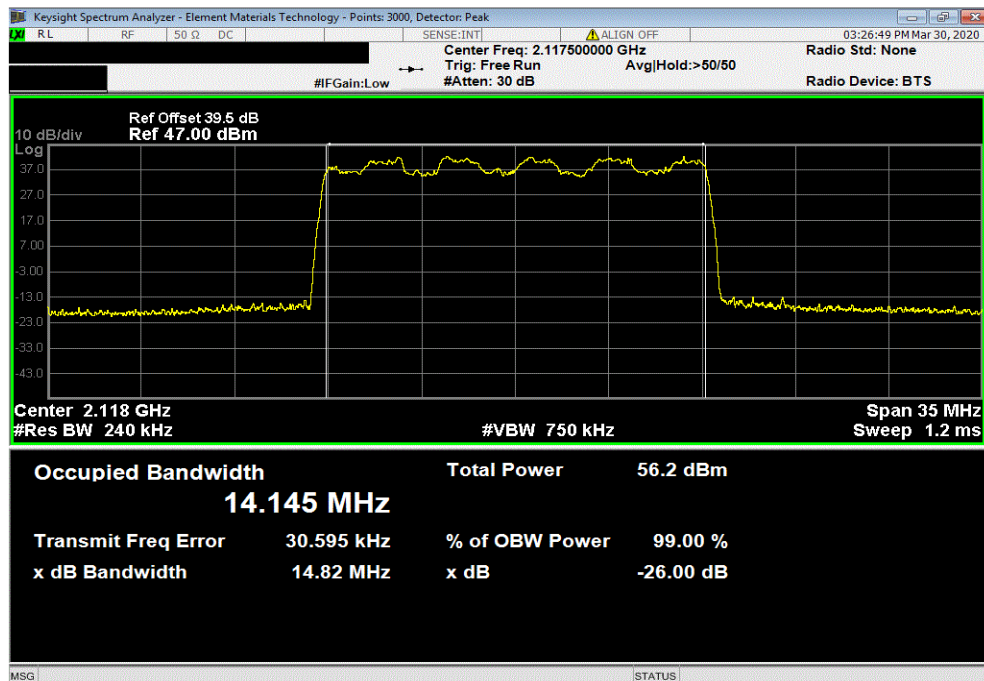


TbTx 2019.08.30.0 XbTx 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, QPSK Modulation, High Channel, 2172.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	14.094	14.834	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 16-QAM Modulation, Low Channel, 2117.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	14.145	14.82	Within Band	Pass		

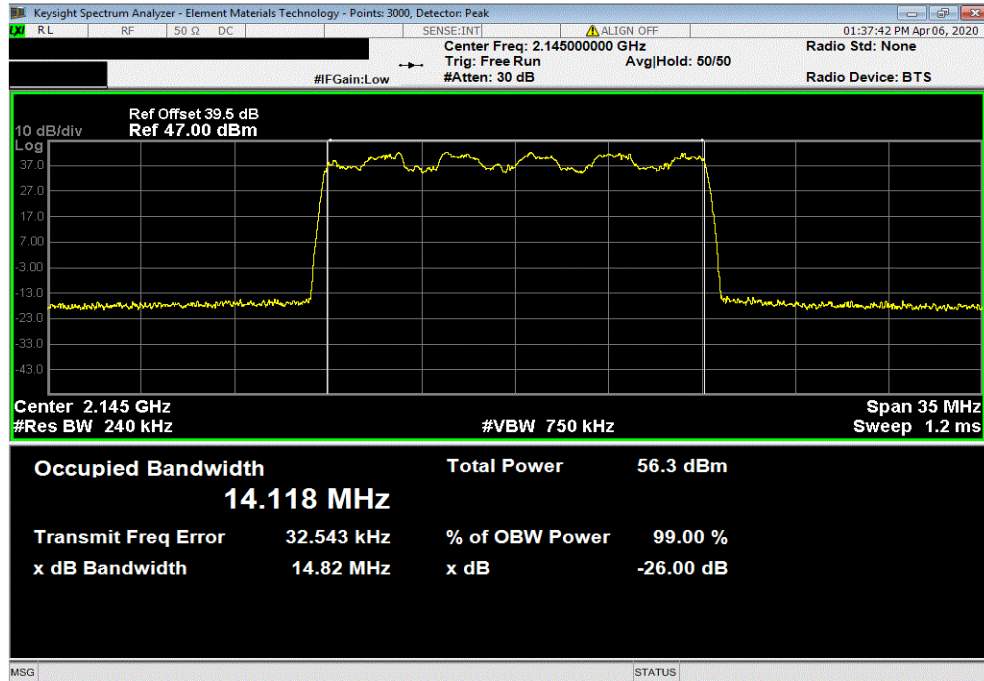


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

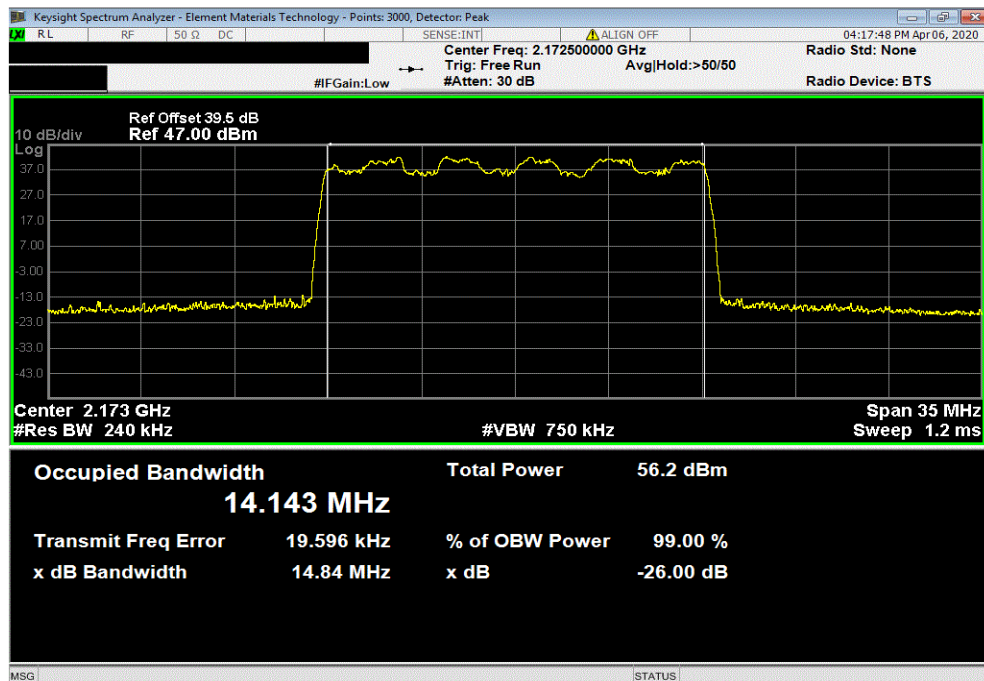


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.118	14.818	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 16-QAM Modulation, High Channel, 2172.5 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.143	14.836	Within Band	Pass		

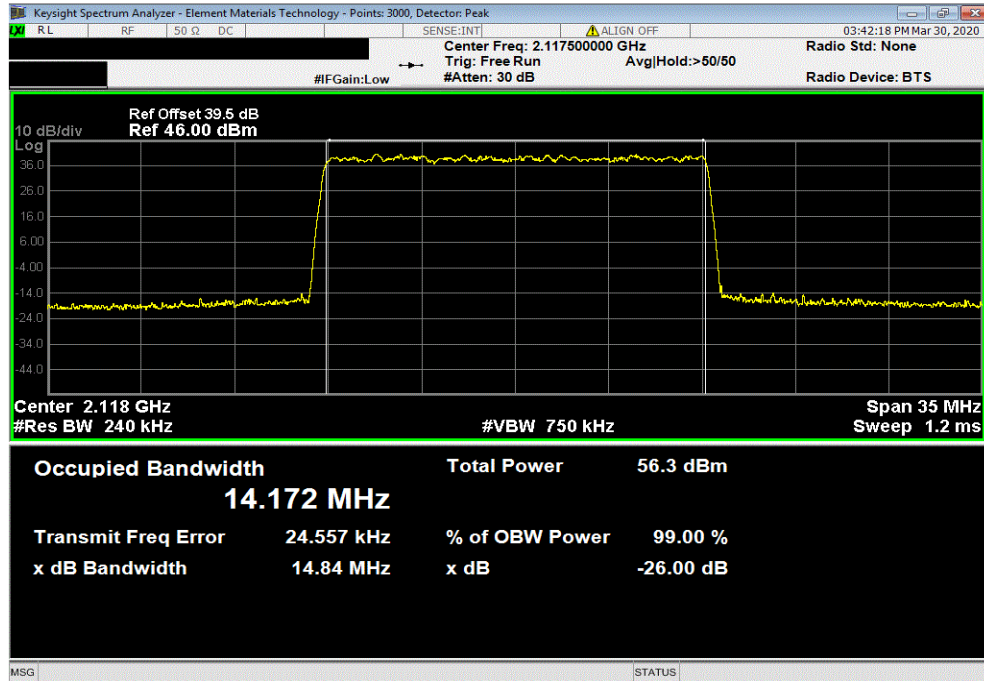


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

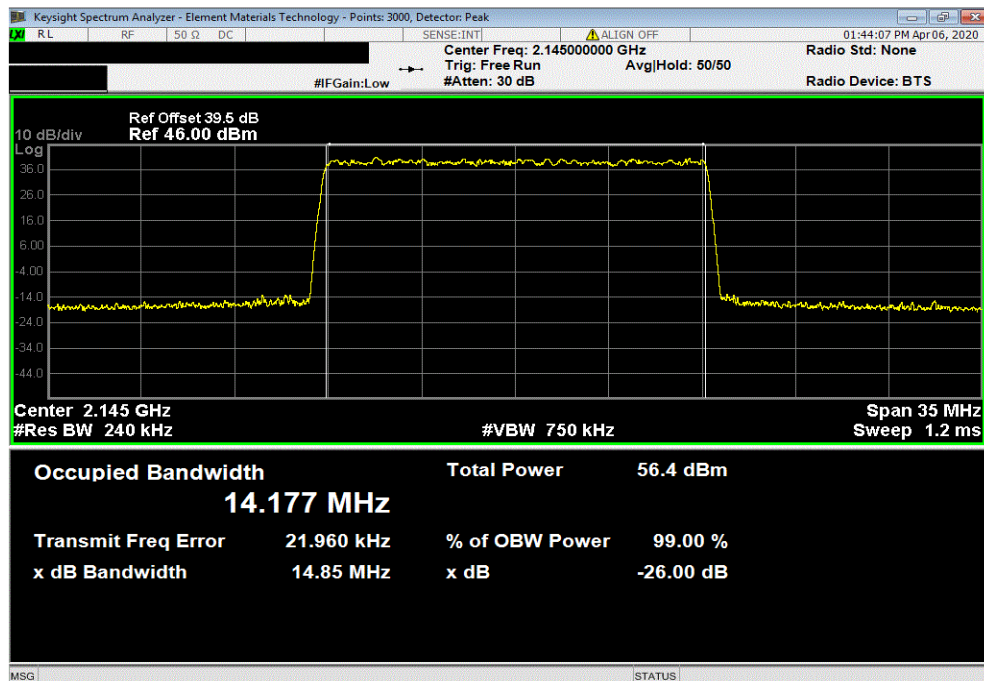


TbTx 2019.08.30.0 XMI 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 64-QAM Modulation, Low Channel, 2117.5 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.172	14.837	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.177	14.851	Within Band	Pass		

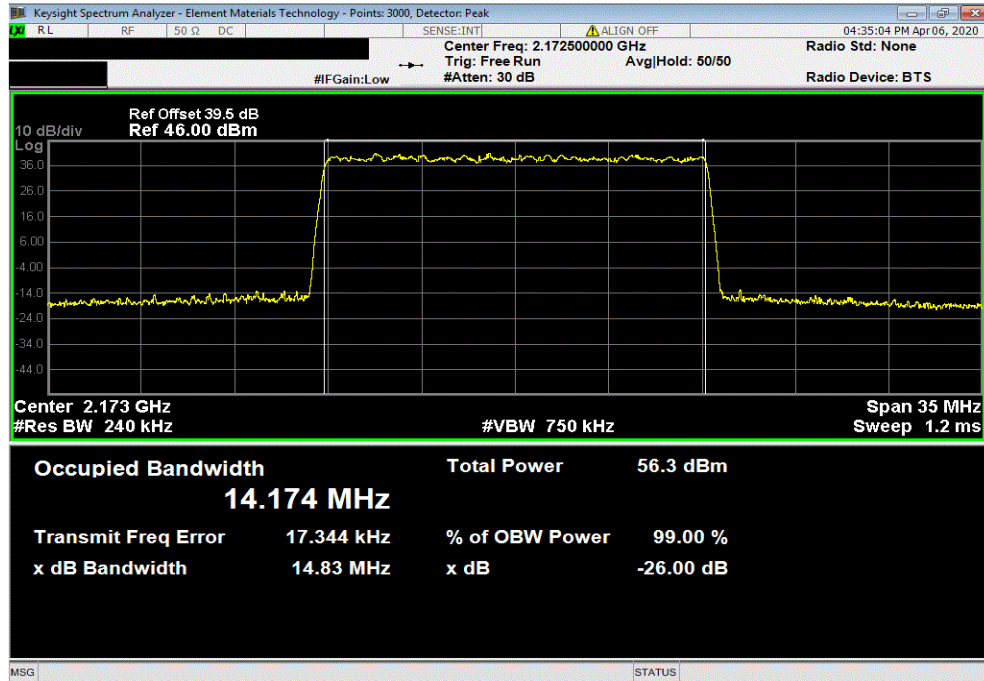


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

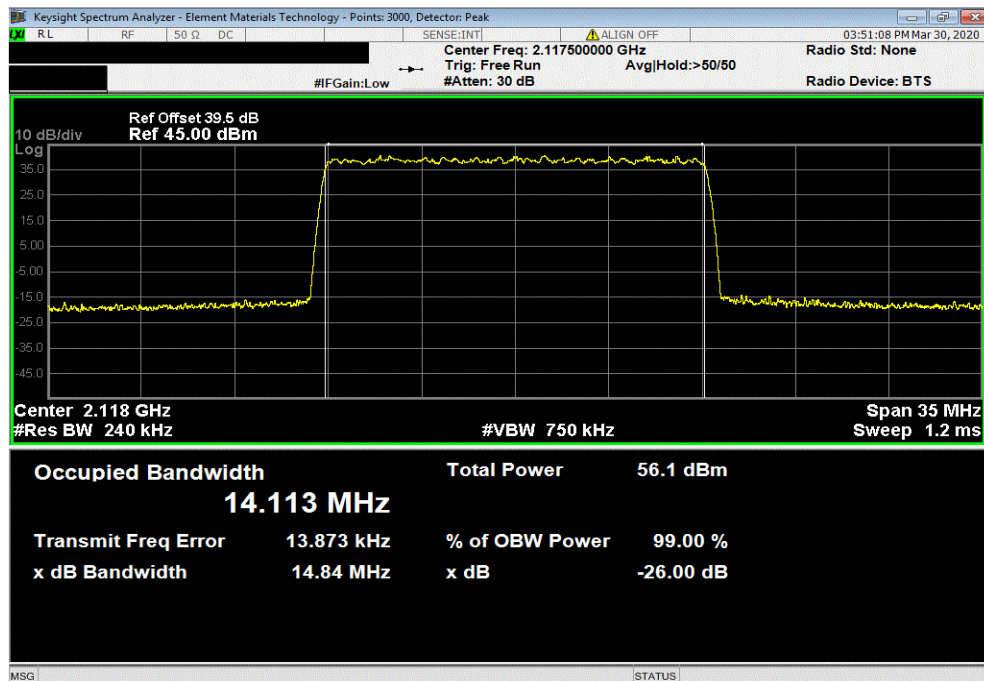


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 64-QAM Modulation, High Channel, 2172.5 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.174	14.826	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 256-QAM Modulation, Low Channel, 2117.5 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	14.113	14.839	Within Band	Pass		

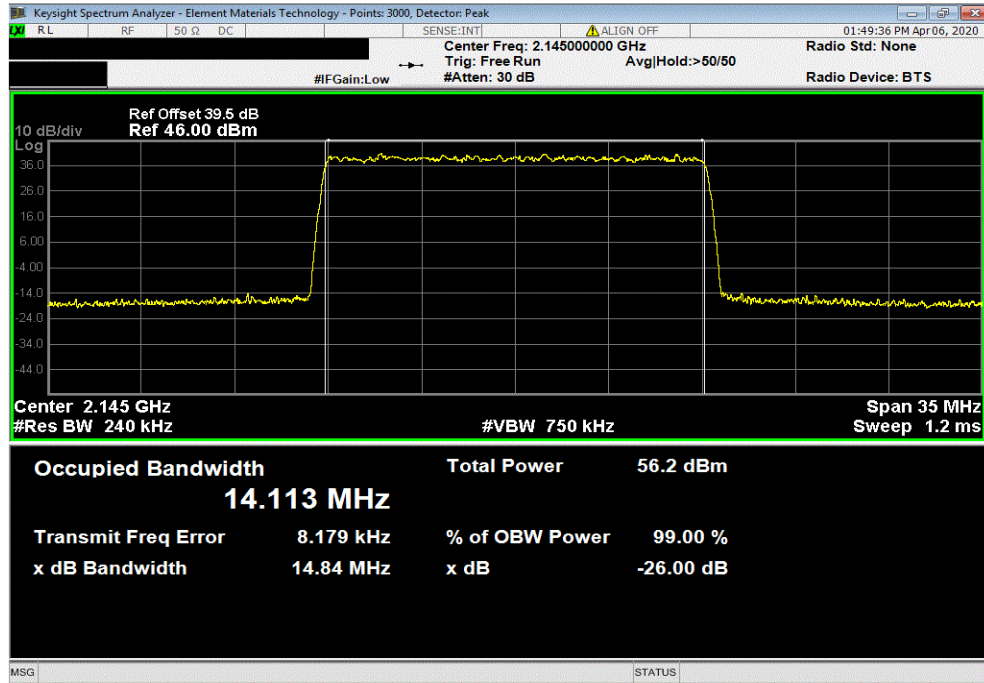


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

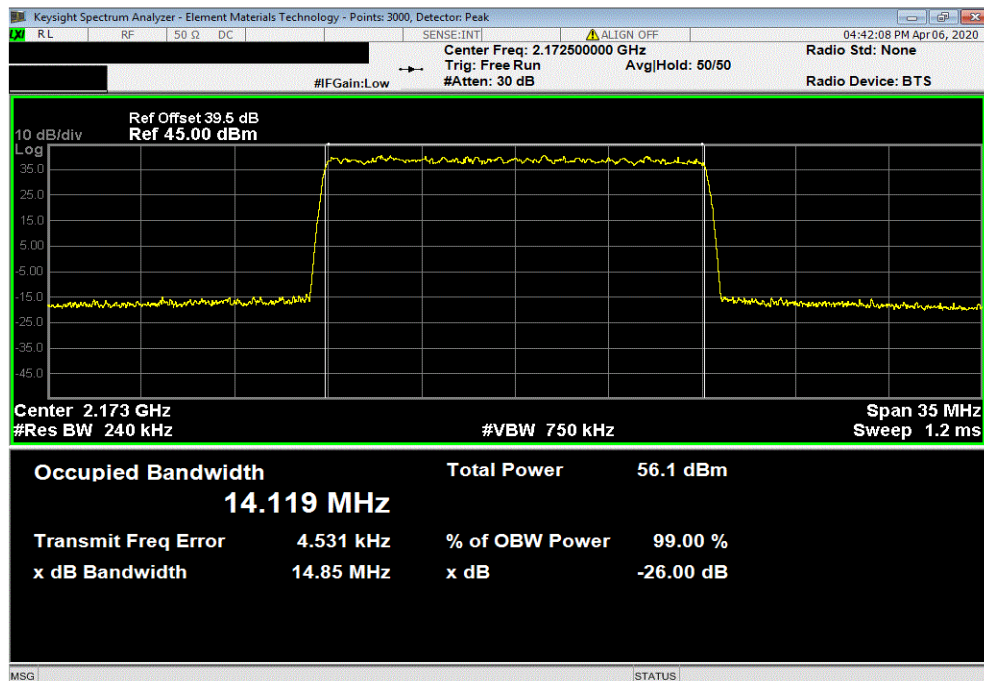


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	14.113	14.845	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 15 MHz Bandwidth, 256-QAM Modulation, High Channel, 2172.5 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	14.119	14.847	Within Band	Pass		

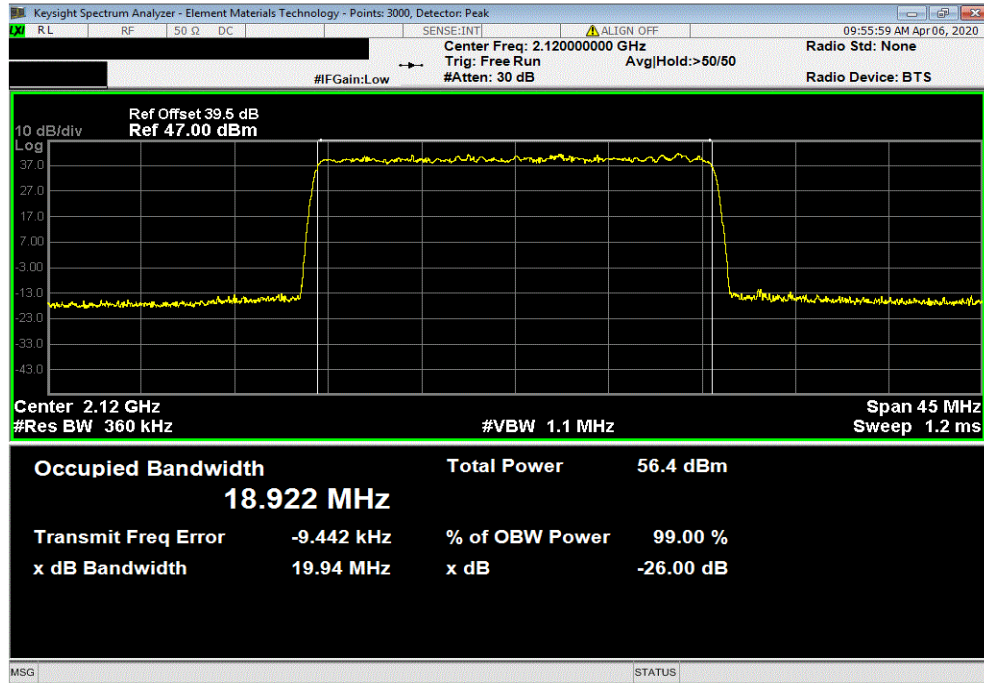


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

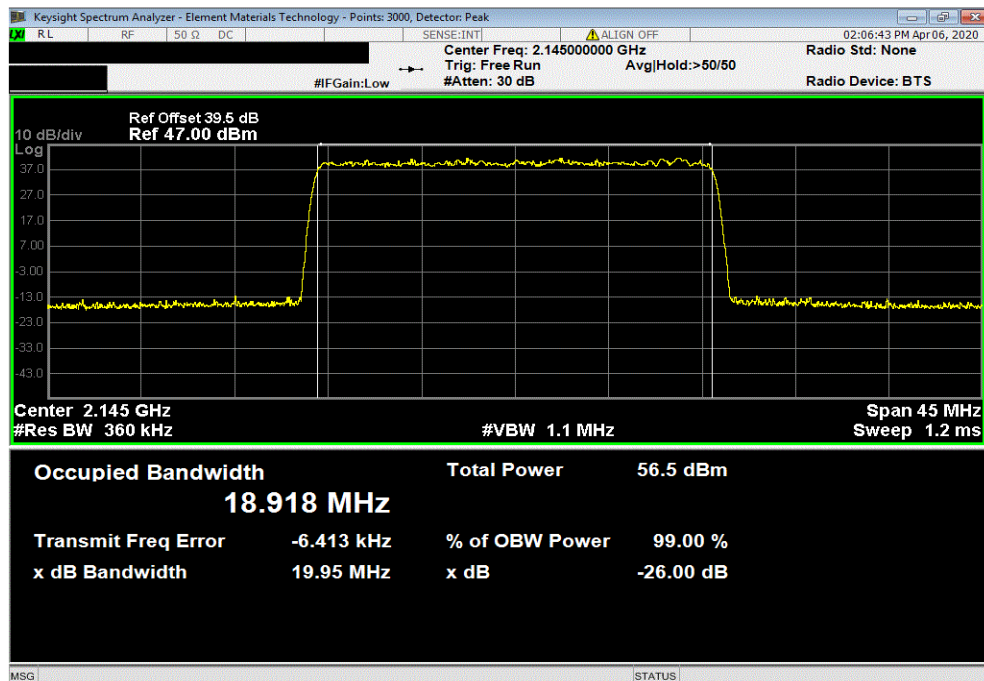


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, QPSK Modulation , Low Channel, 2120 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	18.922	19.94	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, QPSK Modulation , Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	18.918	19.95	Within Band	Pass		

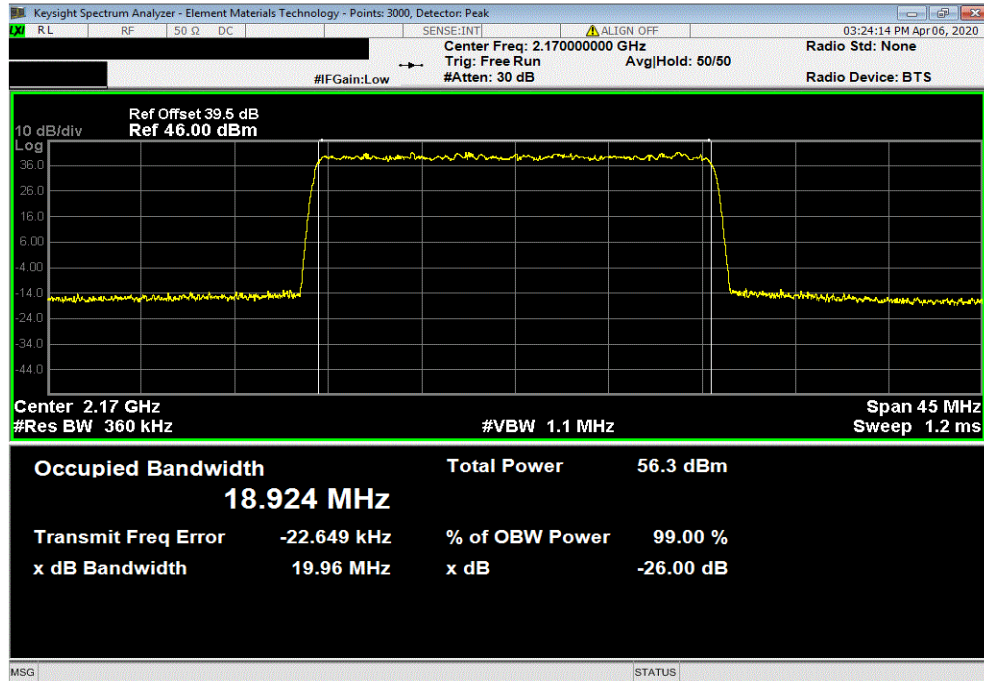


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

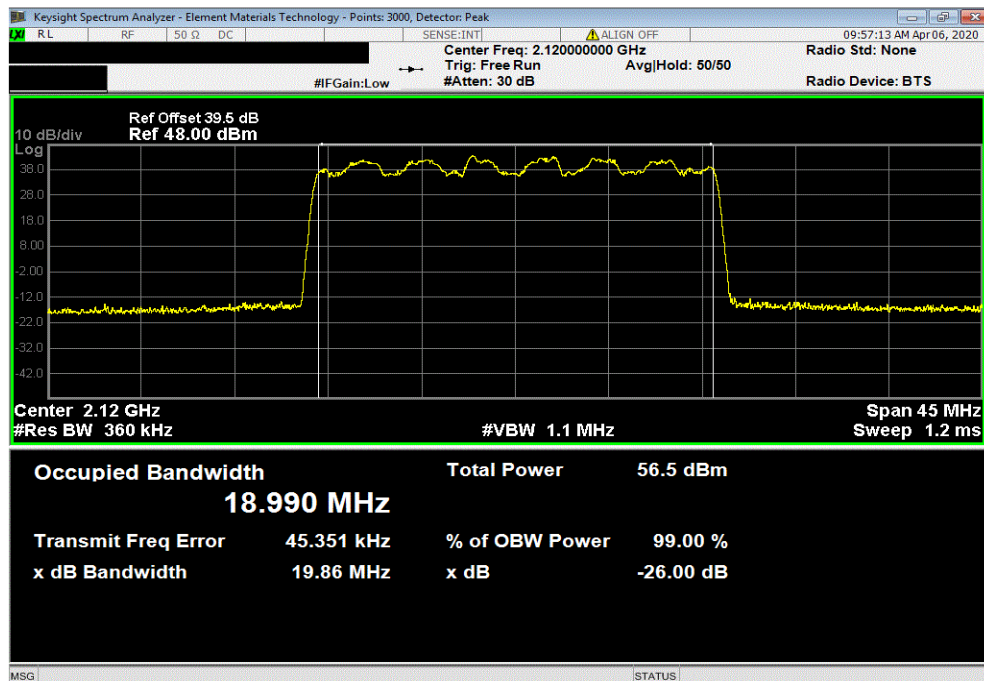


TIMTx 2019.08.30.0 XMI 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, QPSK Modulation , High Channel, 2170 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.924	19.965	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 16-QAM Modulation, Low Channel, 2120 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.99	19.859	Within Band	Pass		

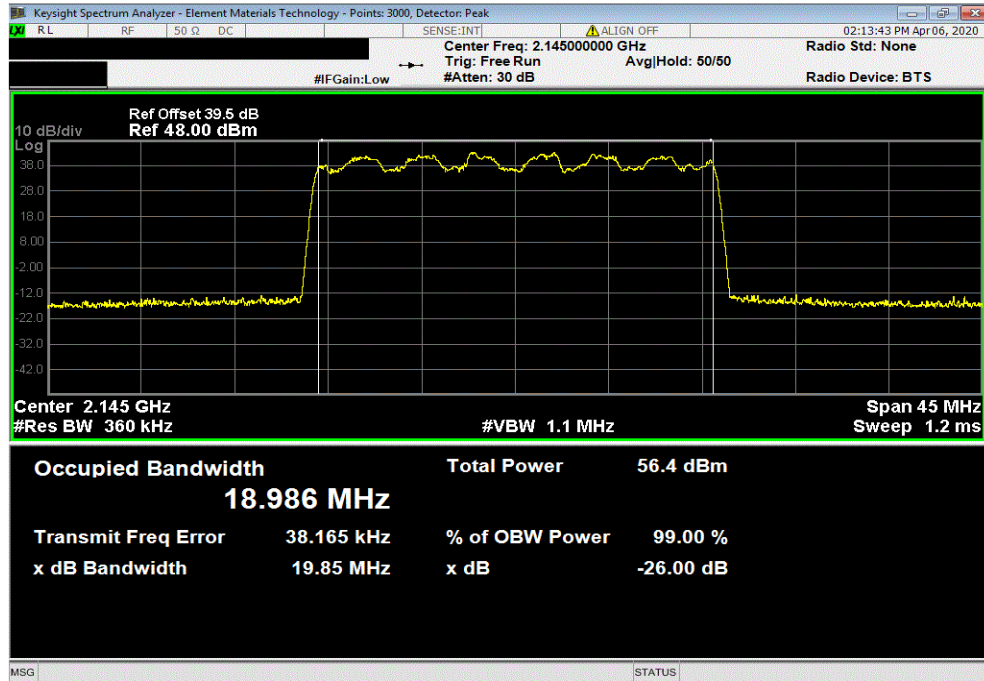


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

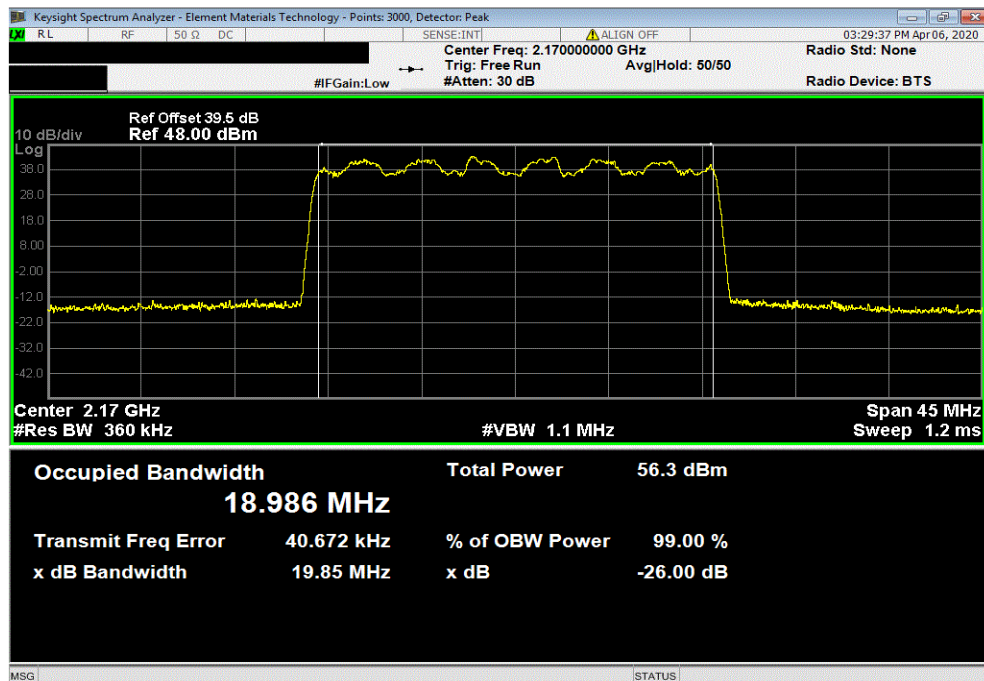


TbTx 2019.08.30.0 XMtX 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 16-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	18.986	19.854	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 16-QAM Modulation, High Channel, 2170 MHz						
	Value	Value	Limit	Result		
	99% (MHz)	26dB (MHz)				
	18.986	19.85	Within Band	Pass		

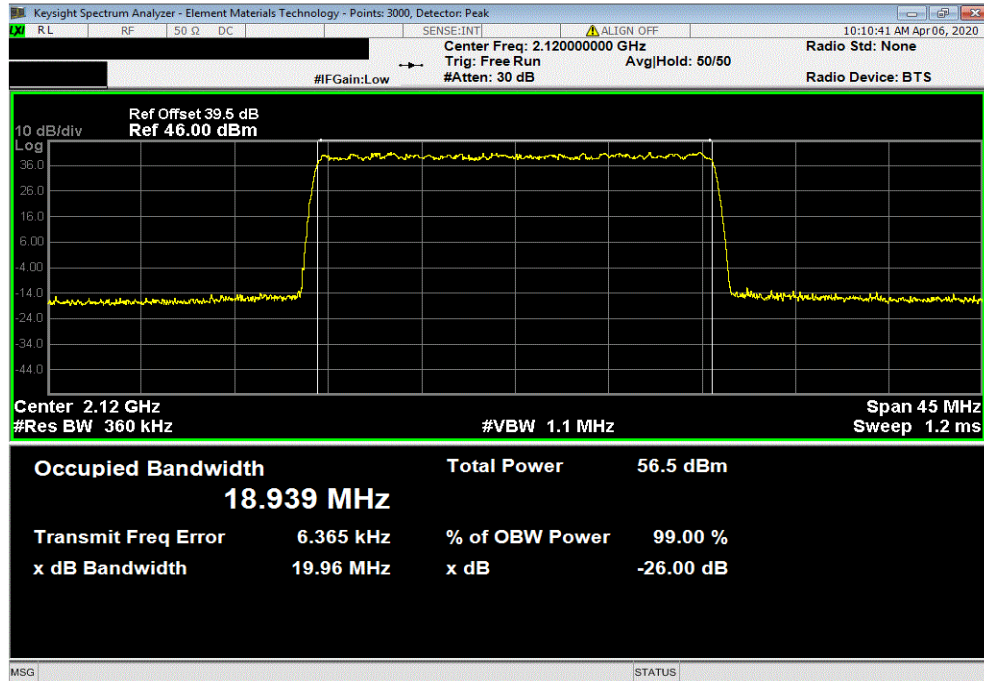


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

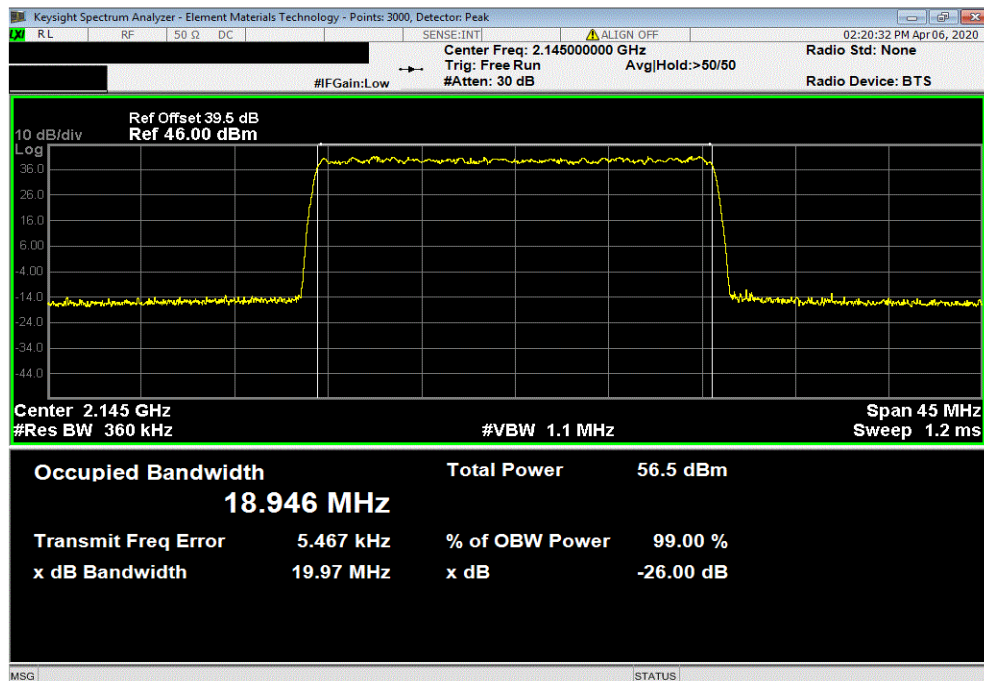


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 64-QAM Modulation, Low Channel, 2120 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.939	19.956	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 64-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.946	19.972	Within Band	Pass		

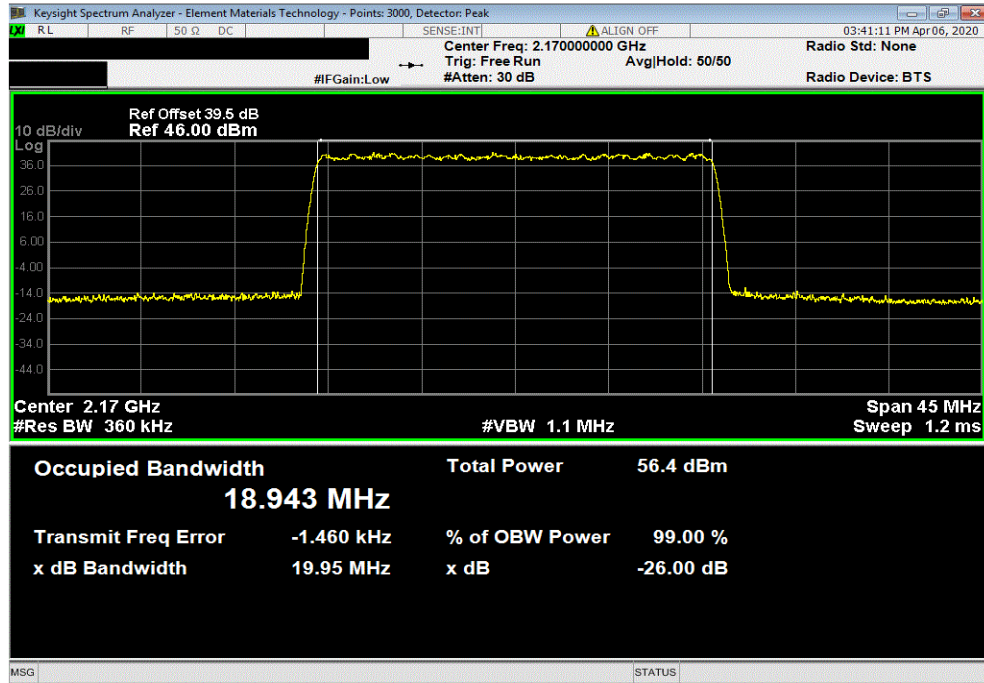


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

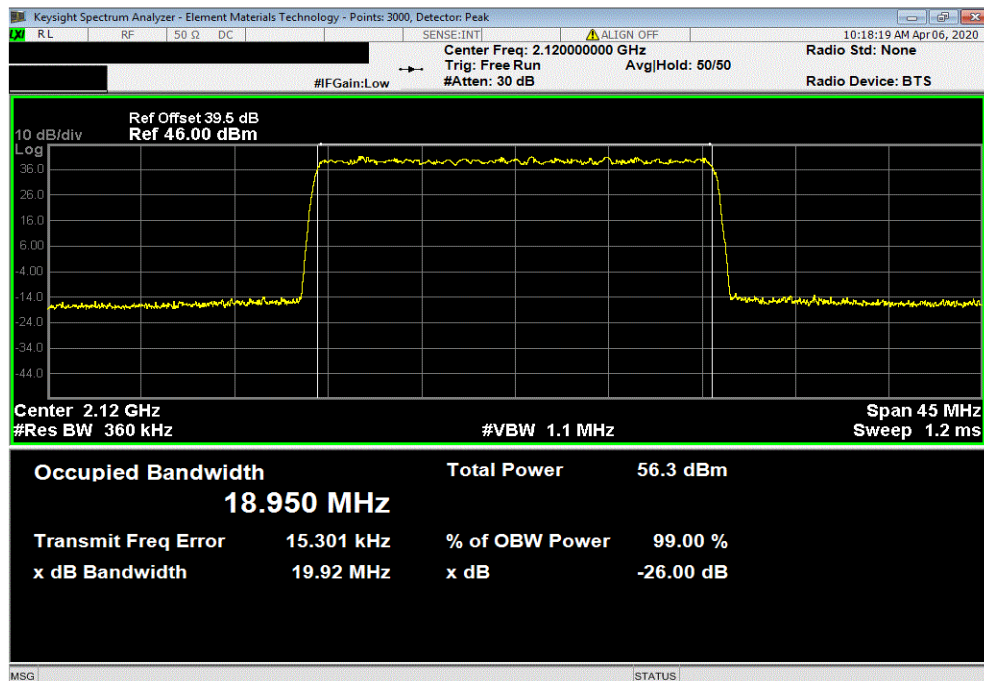


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 64-QAM Modulation, High Channel, 2170 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.943	19.952	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 256-QAM Modulation, Low Channel, 2120 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.95	19.923	Within Band	Pass		

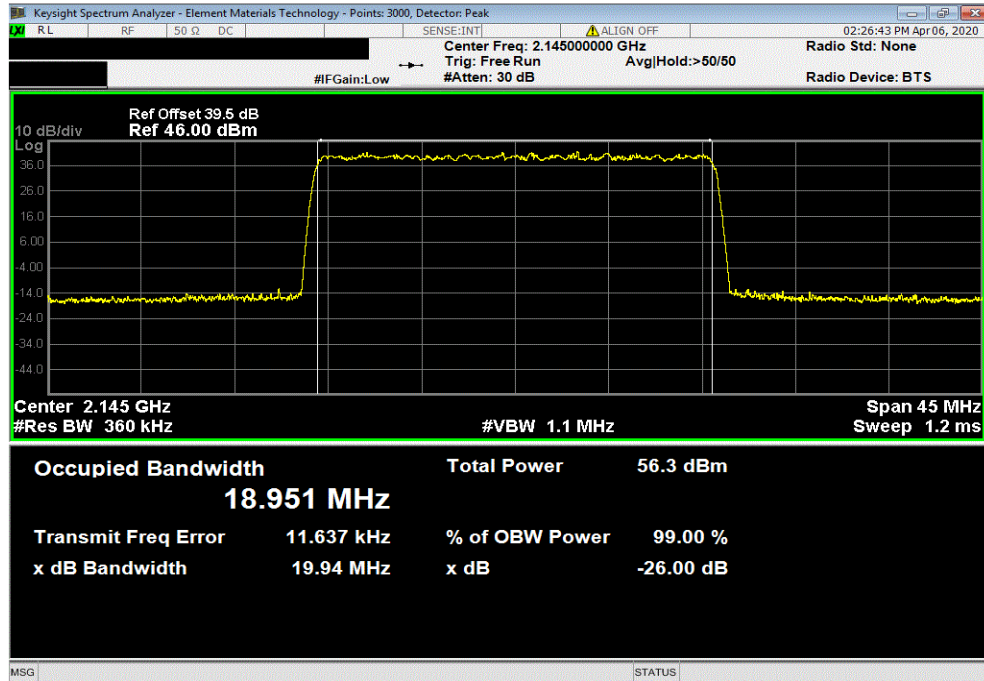


OCCUPIED BANDWIDTH EMISSION MASK BAND 66a

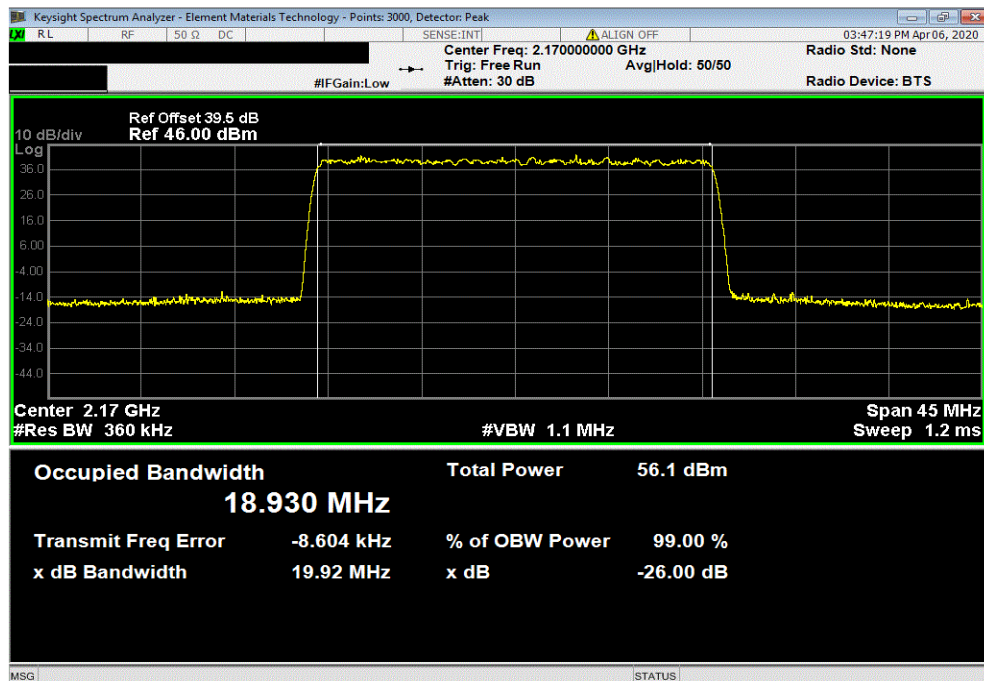


TbTx 2019.08.30.0 XMt 2020.03.25.0

Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, 2145 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.951	19.939	Within Band	Pass		



Band 66a, 2110 MHz - 2180 MHz, 5G, Port 3, 20 MHz Bandwidth, 256-QAM Modulation, High Channel, 2170 MHz						
	Value	Value				
	99% (MHz)	26dB (MHz)	Limit	Result		
	18.93	19.916	Within Band	Pass		



SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2



XMIT 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
Generator - Signal	Keysight	N5171B-506	TEW	2-May-18	2-May-21
Generator - Signal	Agilent	N5173B	TIW	5-Jul-17	5-Jul-20
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	27-Feb-20	27-Feb-21

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 4 different attenuation configurations which continues through to the RF input of the spectrum analyzer. Analyzer plots utilizing a resolution bandwidth called out by the client's test plan were made for each modulation type from 9 KHz to 22 GHz. The peak conducted power of spurious emissions, up to the 10th harmonic of the transmit frequency, were investigated to ensure they were less than the limits also called out by the client's test plan shown below.

The measurement methods are detailed in KDB971168 D01v03 section 6 and ANSI C63.26-2015.

Per FCC 2.1057(a)(1) and RSS Gen 6.13, the upper level of measurement is the 10th harmonic of the highest fundamental frequency.

These measurements are for frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

Per section FCC 24.238(a) and RSS 133 6.5 (ii), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm for a 1 MHz measurement bandwidth. The limit is adjusted to -19 dBm $[-13 \text{ dBm} - 10 \log(4)]$ per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter. .

The limit for the 9kHz to 150kHz frequency range was adjusted to -49dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 1MHz [i.e.: $-49\text{dBm} = -19\text{dBm} - 10\log(1\text{MHz}/1\text{kHz})$]. The limit for the 150kHz to 20MHz frequency range was adjusted to -39dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 1MHz [i.e.: $-39\text{dBm} = -19\text{dBm} - 10\log(1\text{MHz}/10\text{kHz})$]. The required limit of -19dBm with a RBW of > 1MHz was used for all other frequency ranges.

SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND

2



XMI 2020.03.25.0

EUT: AHFIC		Work Order: NOKI0007	
Serial Number: K9180317594		Date: 8-Apr-20	
Customer: Nokia Solutions and Networks		Temperature: 22.4 °C	
Attendees: Mitch Hill, John Rattanaovong		Humidity: 50% RH	
Project: None		Barometric Pres.: 1016 mbar	
Tested by: Brandon Hobbs		Power: 54 VDC	Job Site: TX03
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 hottest port was used for testing. The worst case port was determined in the original client test report. The carrier power was set to maximum for all testing.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	5,6,7,8	Signature 	
		Value (dBm)	Limit (dBm) Result
Band 2, 1930 MHz - 1990 MHz, 5G			
Port 7			
5 MHz Bandwidth			
QPSK Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-58.7	-49 Pass
Range 2, 150 kHz - 20 MHz		-56.8	-39 Pass
Range 3, 20 MHz - 3 GHz		-28.0	-19 Pass
Range 4, 3 GHz - 18 GHz		-38.1	-19 Pass
Range 5, 18 GHz - 22 GHz		-28.3	-19 Pass
16-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-58.2	-49 Pass
Range 2, 150 kHz - 20 MHz		-57.0	-39 Pass
Range 3, 20 MHz - 3 GHz		-26.7	-19 Pass
Range 4, 3 GHz - 18 GHz		-36.6	-19 Pass
Range 5, 18 GHz - 22 GHz		-28.8	-19 Pass
64-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-58.9	-49 Pass
Range 2, 150 kHz - 20 MHz		-57.0	-39 Pass
Range 3, 20 MHz - 3 GHz		-27.1	-19 Pass
Range 4, 3 GHz - 18 GHz		-37.8	-19 Pass
Range 5, 18 GHz - 22 GHz		-29.1	-19 Pass
256-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-59.6	-49 Pass
Range 2, 150 kHz - 20 MHz		-57.4	-39 Pass
Range 3, 20 MHz - 3 GHz		-27.7	-19 Pass
Range 4, 3 GHz - 18 GHz		-37.3	-19 Pass
Range 5, 18 GHz - 22 GHz		-29.1	-19 Pass
10 MHz Bandwidth			
256-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-59.9	-49 Pass
Range 2, 150 kHz - 20 MHz		-56.8	-39 Pass
Range 3, 20 MHz - 3 GHz		-26.9	-19 Pass
Range 4, 3 GHz - 18 GHz		-37.5	-19 Pass
Range 5, 18 GHz - 22 GHz		-28.9	-19 Pass
15 MHz Bandwidth			
256-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-60.3	-49 Pass
Range 2, 150 kHz - 20 MHz		-57.1	-39 Pass
Range 3, 20 MHz - 3 GHz		-27.5	-19 Pass
Range 4, 3 GHz - 18 GHz		-37.2	-19 Pass
Range 5, 18 GHz - 22 GHz		-28.1	-19 Pass
20 MHz Bandwidth			
256-QAM Modulation, Mid Channel			
Range 1, 9 kHz - 150 kHz		-59.1	-49 Pass
Range 2, 150 kHz - 20 MHz		-57.2	-39 Pass
Range 3, 20 MHz - 3 GHz		-27.6	-19 Pass
Range 4, 3 GHz - 18 GHz		-37.9	-19 Pass
Range 5, 18 GHz - 22 GHz		-28.6	-19 Pass

element

XMIT 2020.03.25.0

				Value (dBm)	Limit (dBm)	Result
				-58.655	-49	Pass

				Value (dBm)	Limit (dBm)	Result
				-56.801	-39	Pass

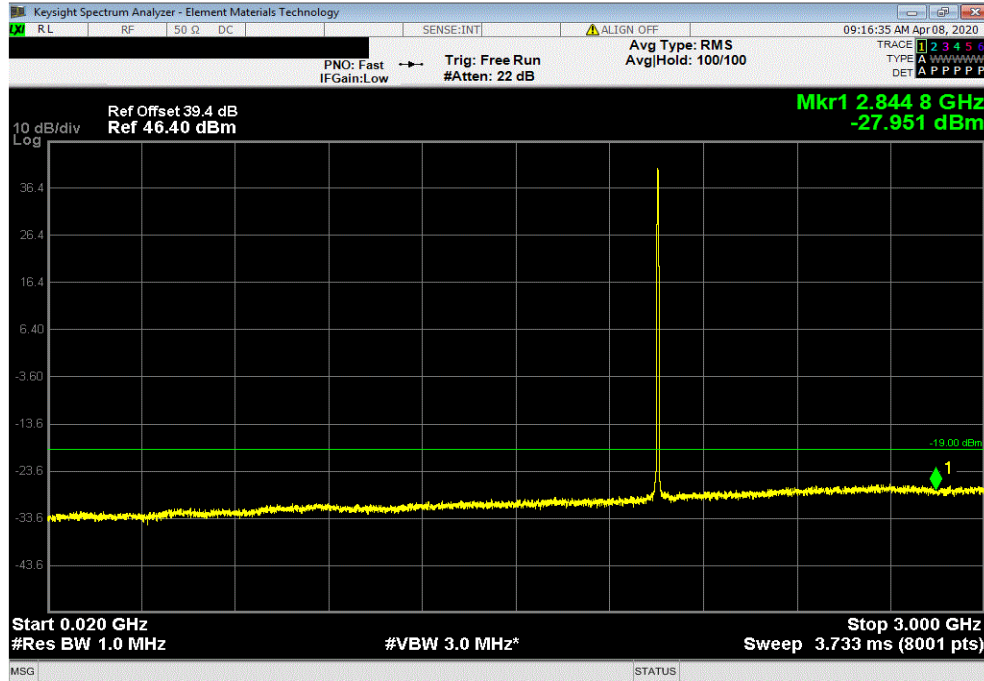
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2



XMI 2020.03.25.0

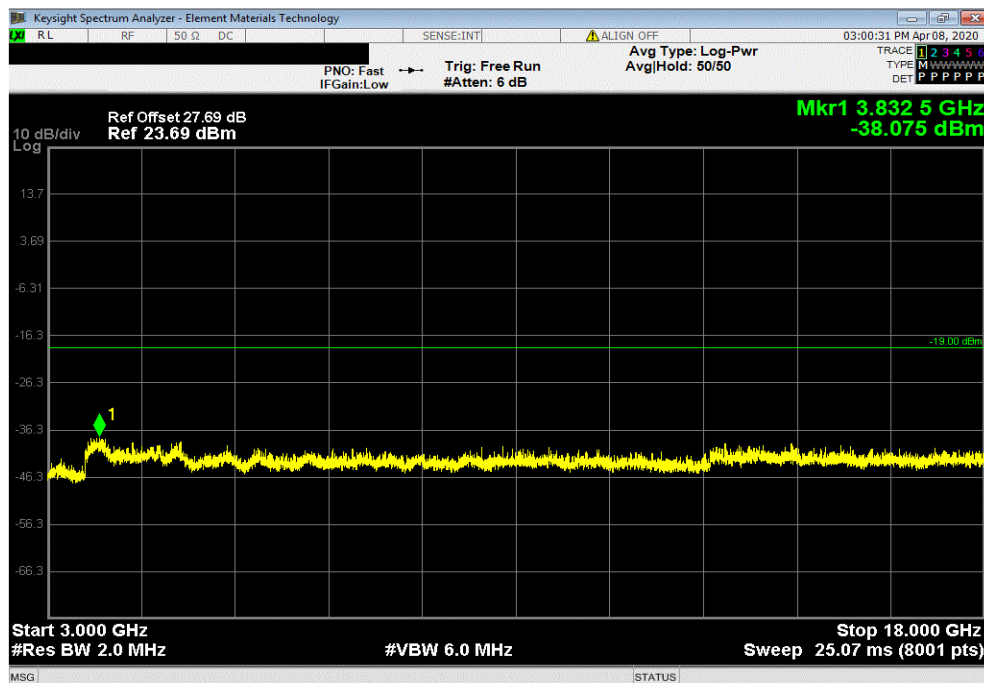
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, QPSK Modulation, Mid Channel , Range 3, 20 MHz - 3 GHz

				Value (dBm)	Limit (dBm)	Result
				-27.951	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, QPSK Modulation, Mid Channel , Range 4, 3 GHz - 18 GHz

				Value (dBm)	Limit (dBm)	Result
				-38.075	-19	Pass



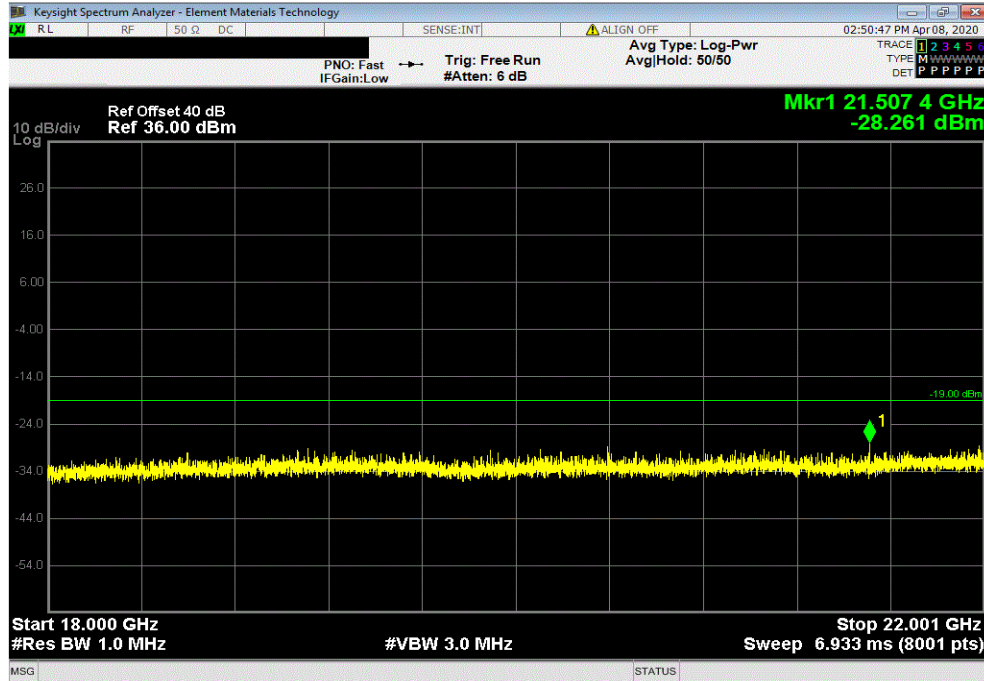
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2



XMR 2020.03.25.0

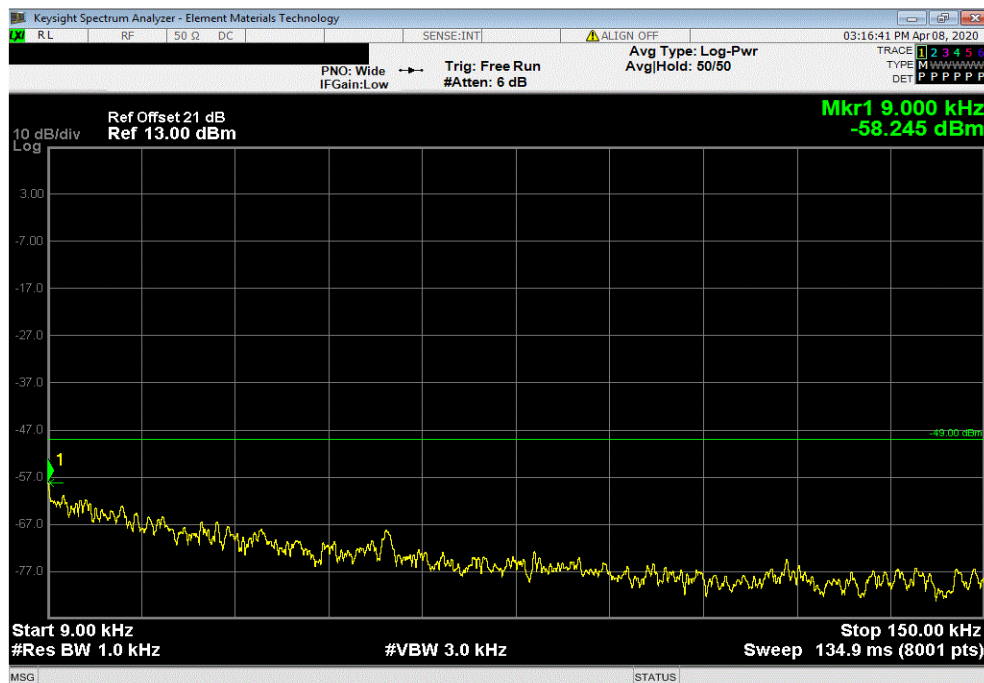
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, QPSK Modulation, Mid Channel , Range 5, 18 GHz - 22 GHz

				Value (dBm)	Limit (dBm)	Result
				-28.261	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz

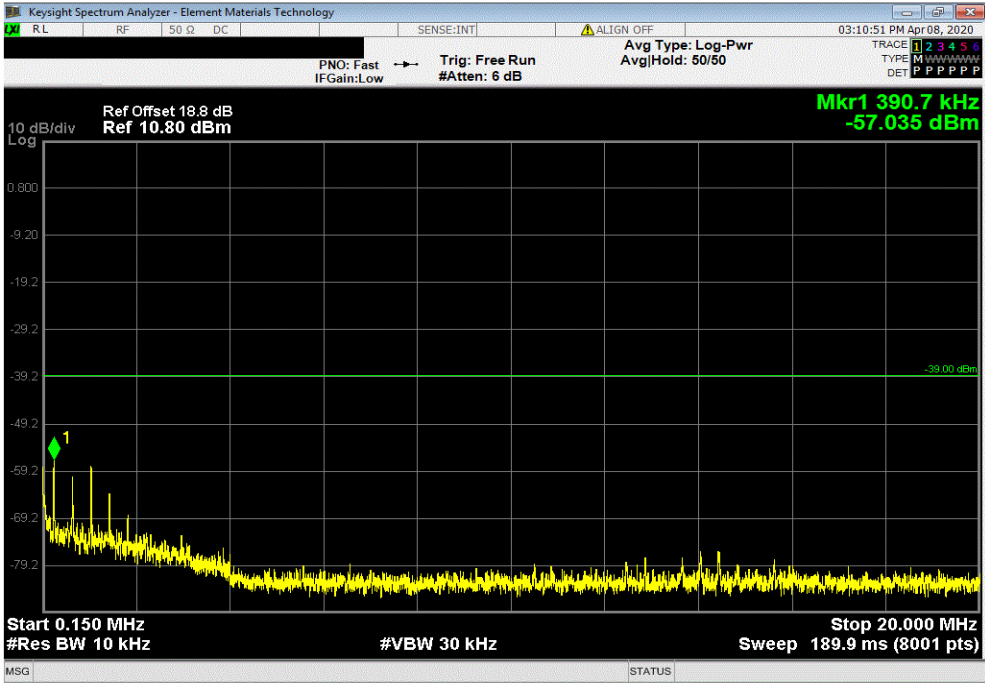
				Value (dBm)	Limit (dBm)	Result
				-58.245	-49	Pass



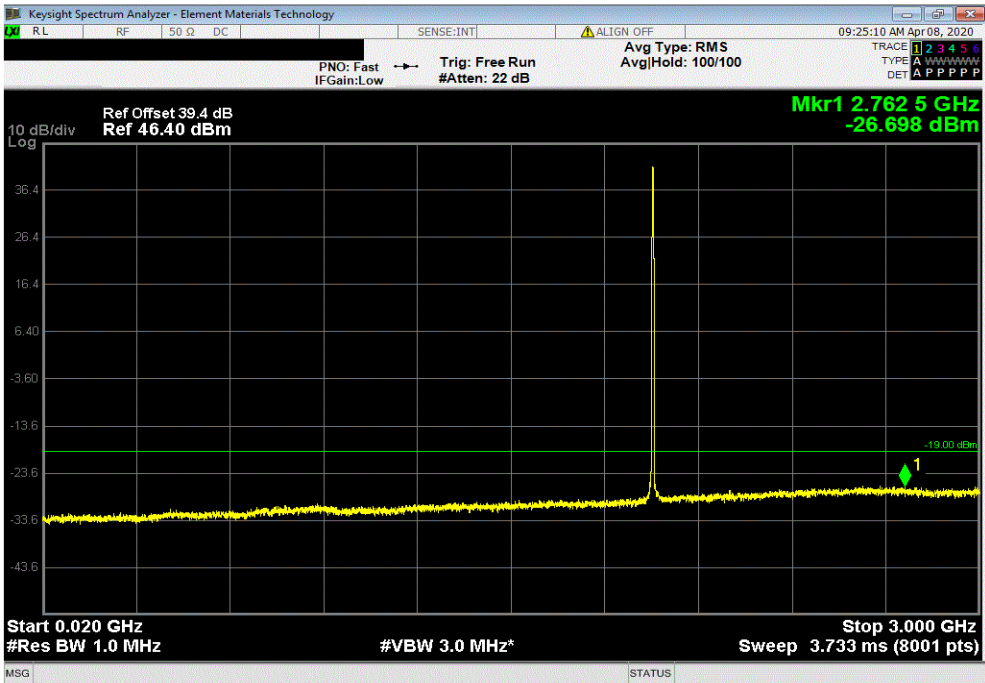
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-57.035	-39	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-26.698	-19	Pass



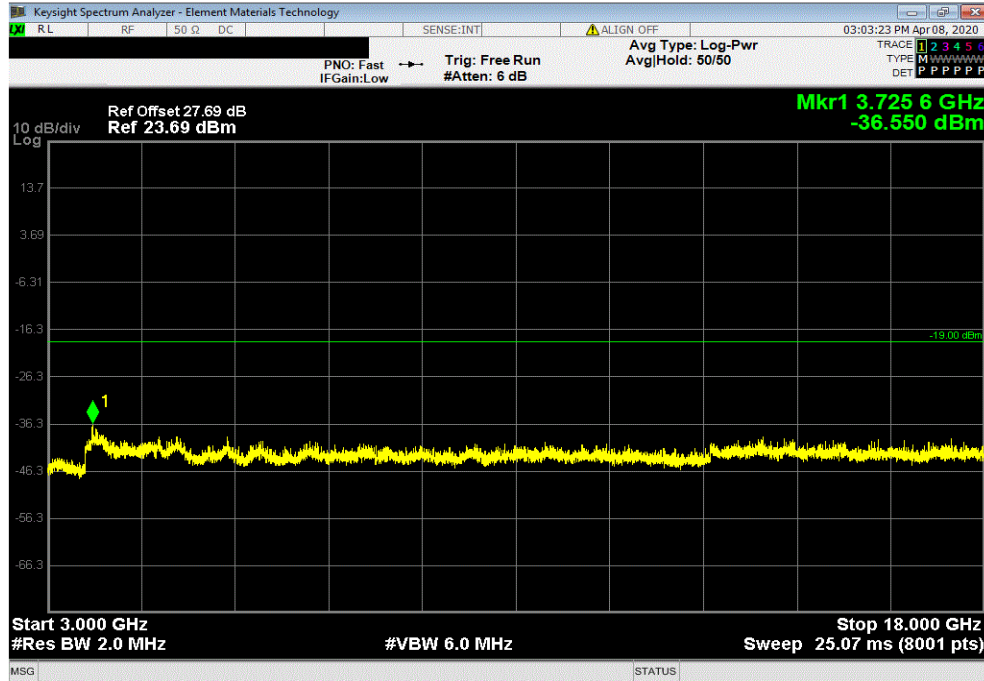
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2



XMI 2020.03.25.0

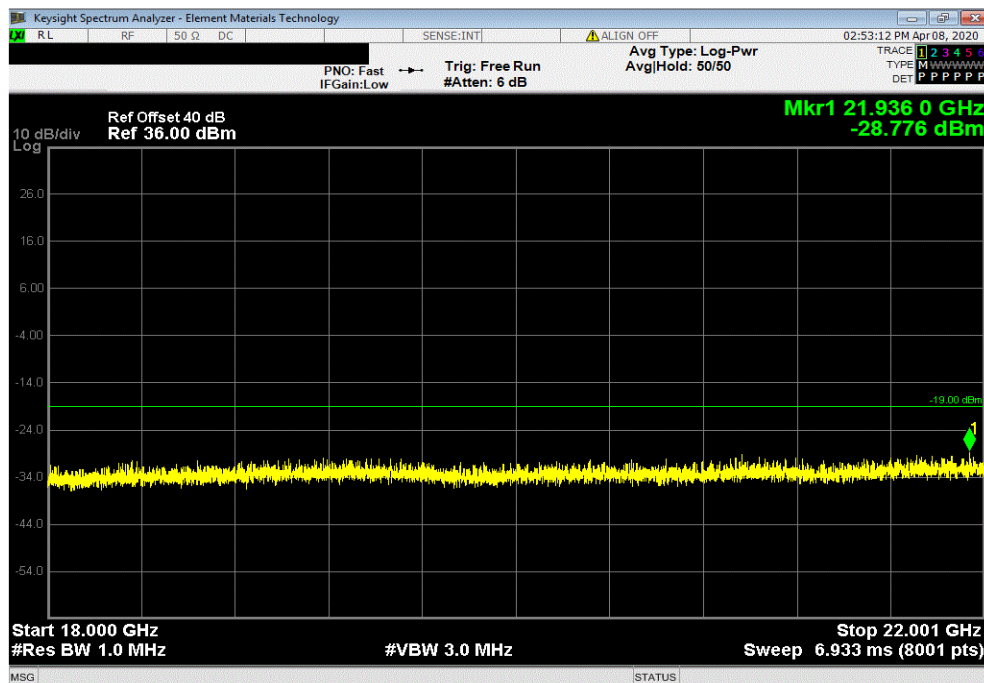
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz

				Value (dBm)	Limit (dBm)	Result
				-36.55	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 16-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz

				Value (dBm)	Limit (dBm)	Result
				-28.776	-19	Pass

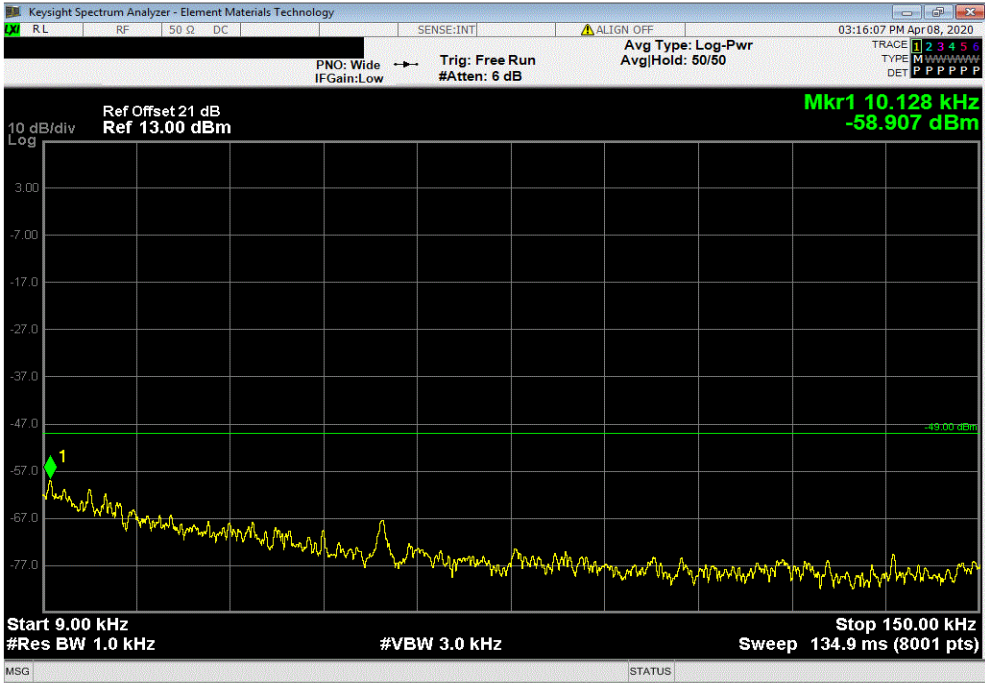


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

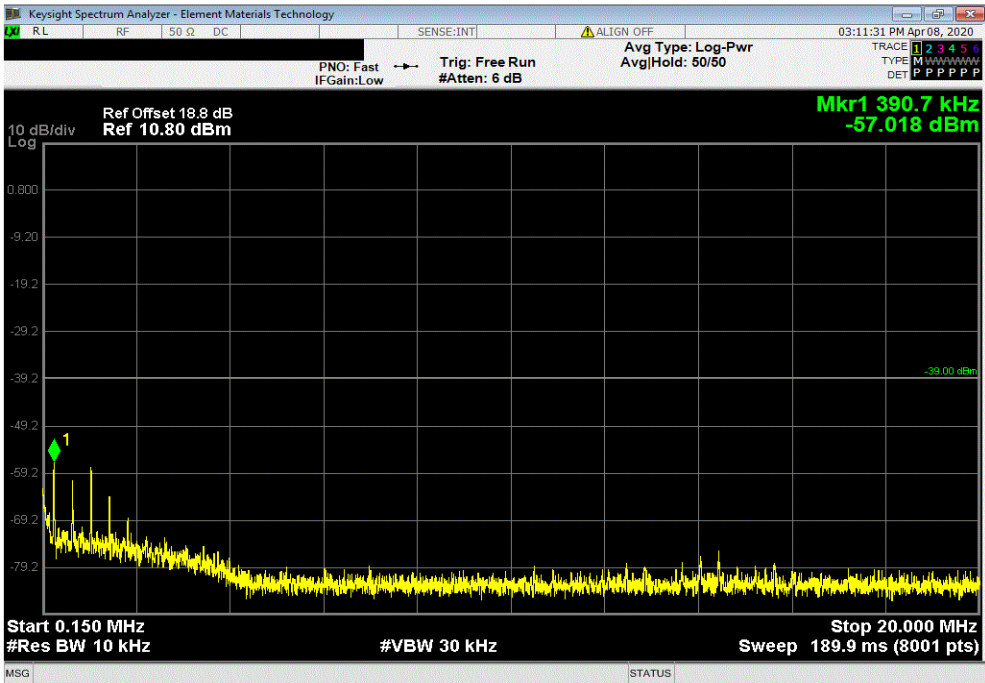
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz						
				Value (dBm)	Limit (dBm)	Result
				-58.907	-49	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-57.018	-39	Pass

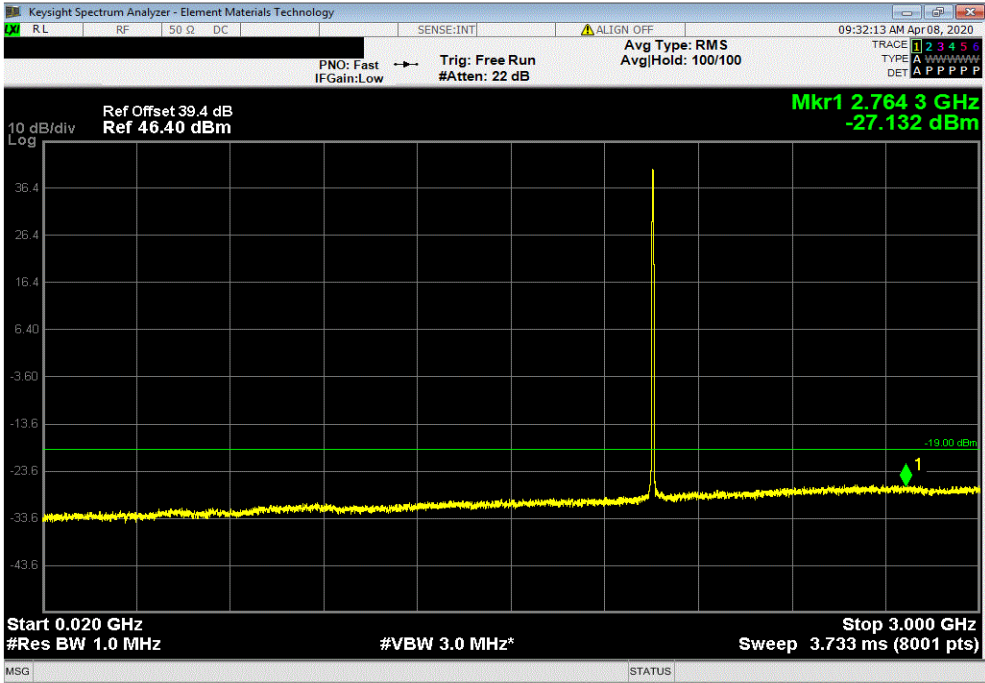


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

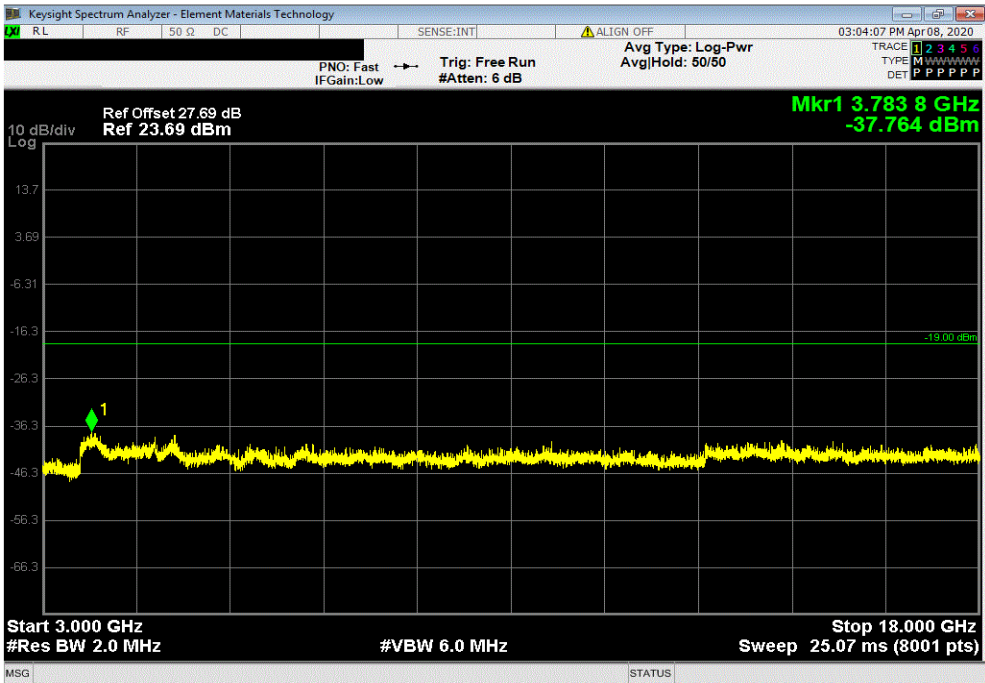
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-27.132	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz						
				Value (dBm)	Limit (dBm)	Result
				-37.764	-19	Pass



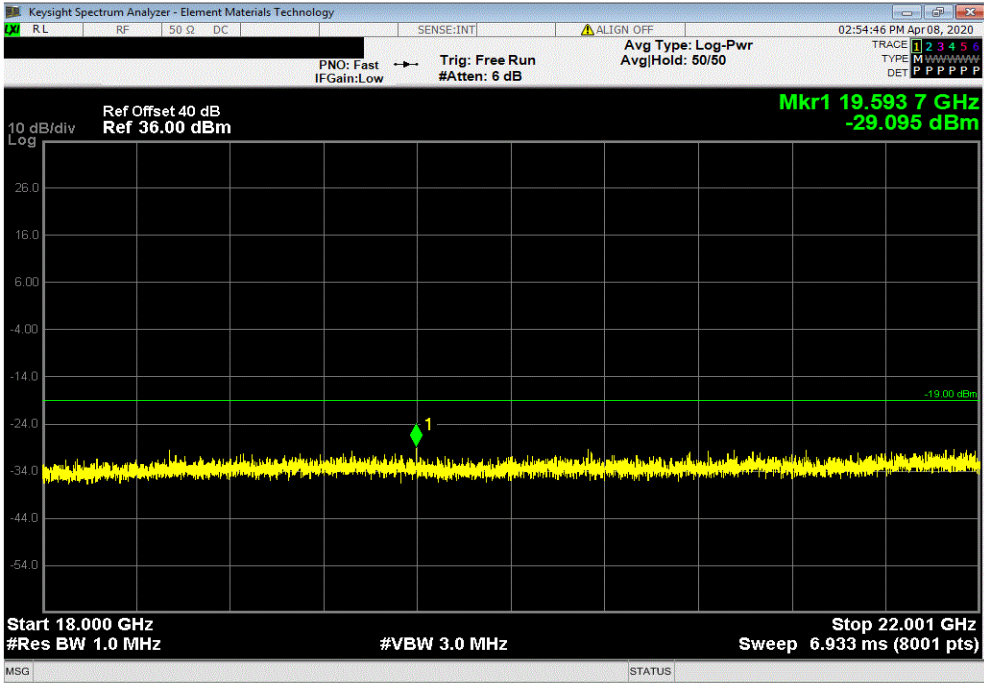
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

BAND 2

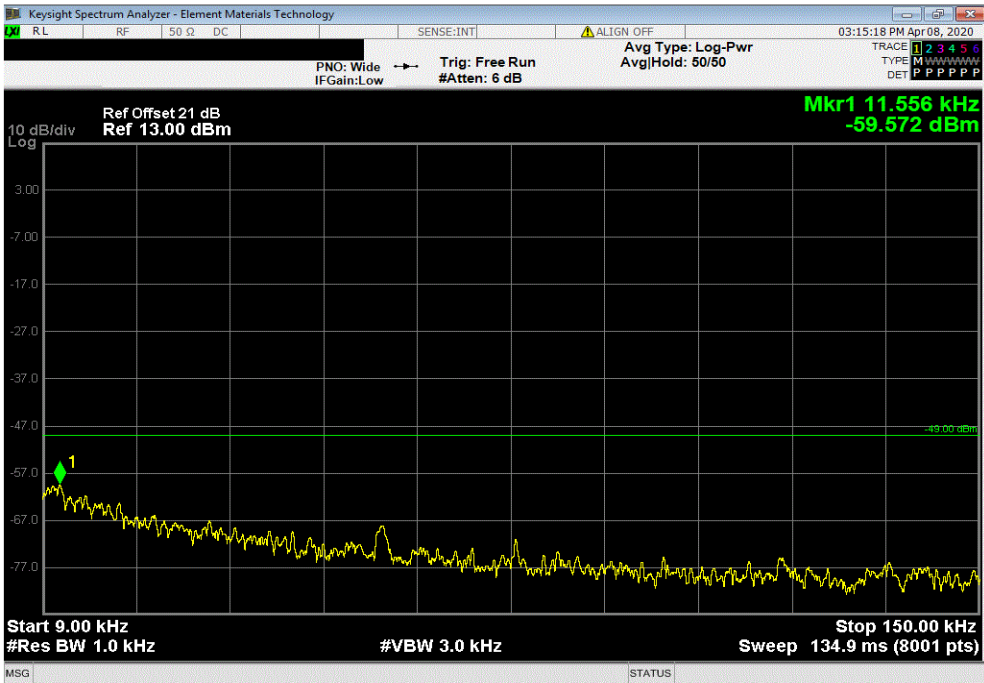


XMI 2020.03.25.0

Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 64-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz						
				Value (dBm)	Limit (dBm)	Result
				-29.095	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.572	-49	Pass

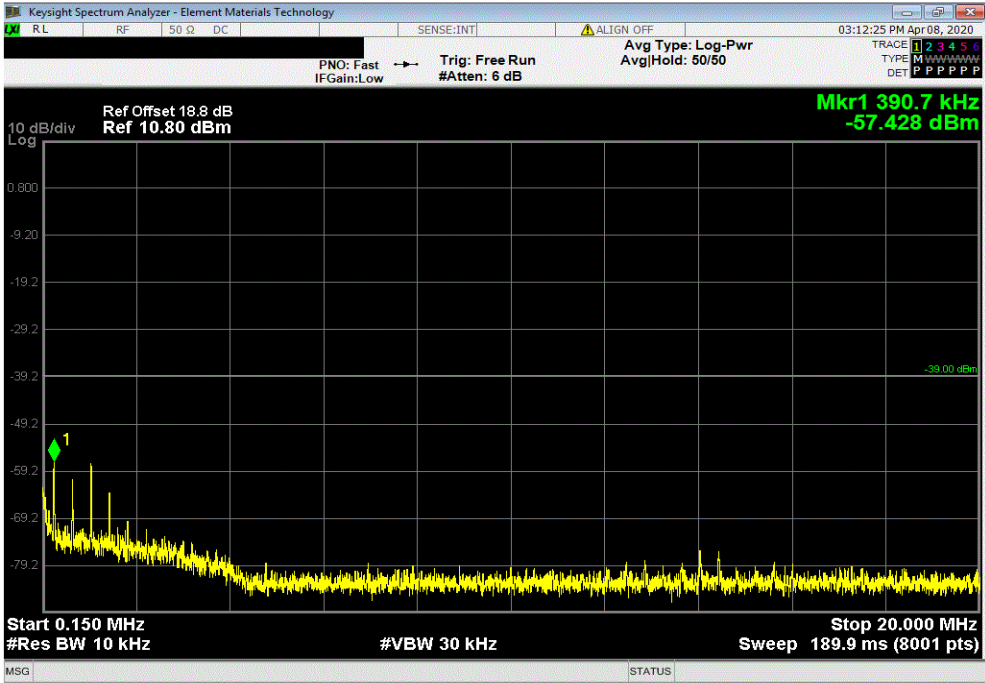


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

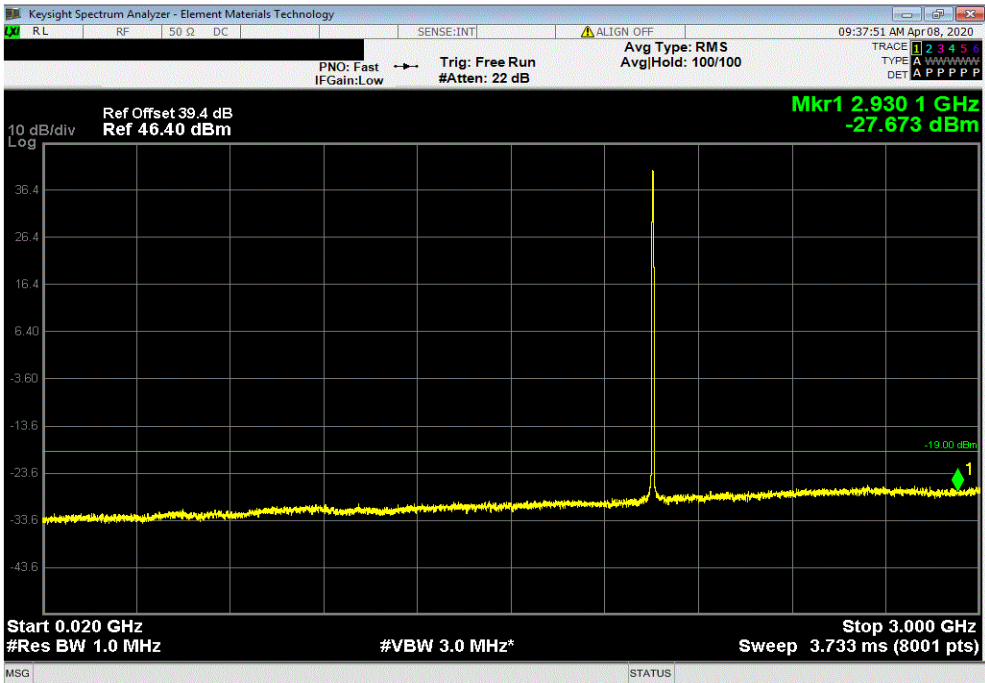
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-57.428	-39	Pass



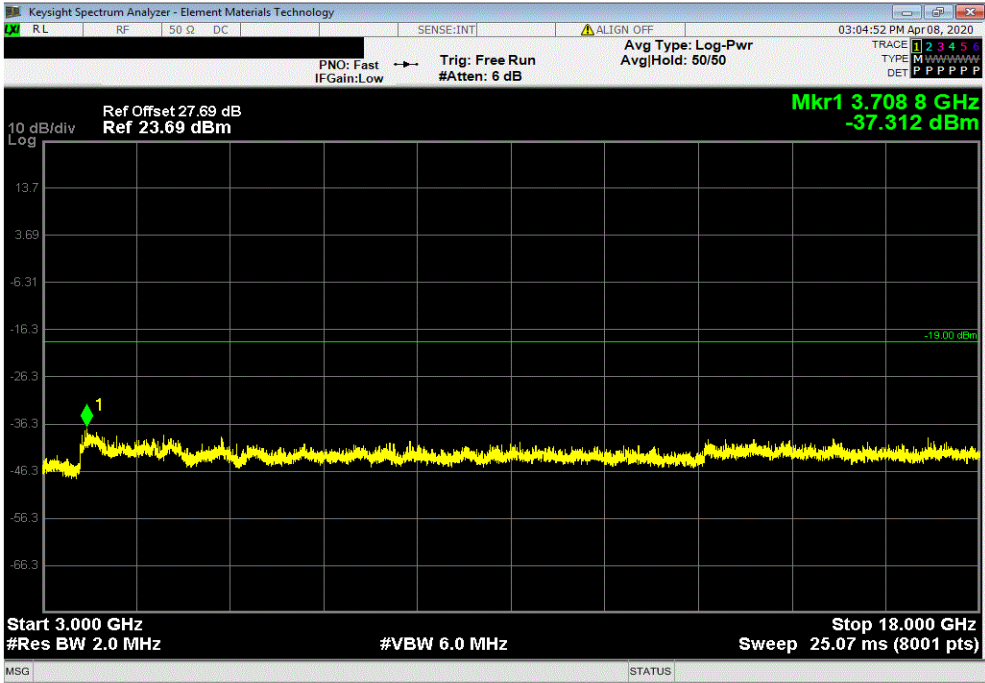
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-27.673	-19	Pass



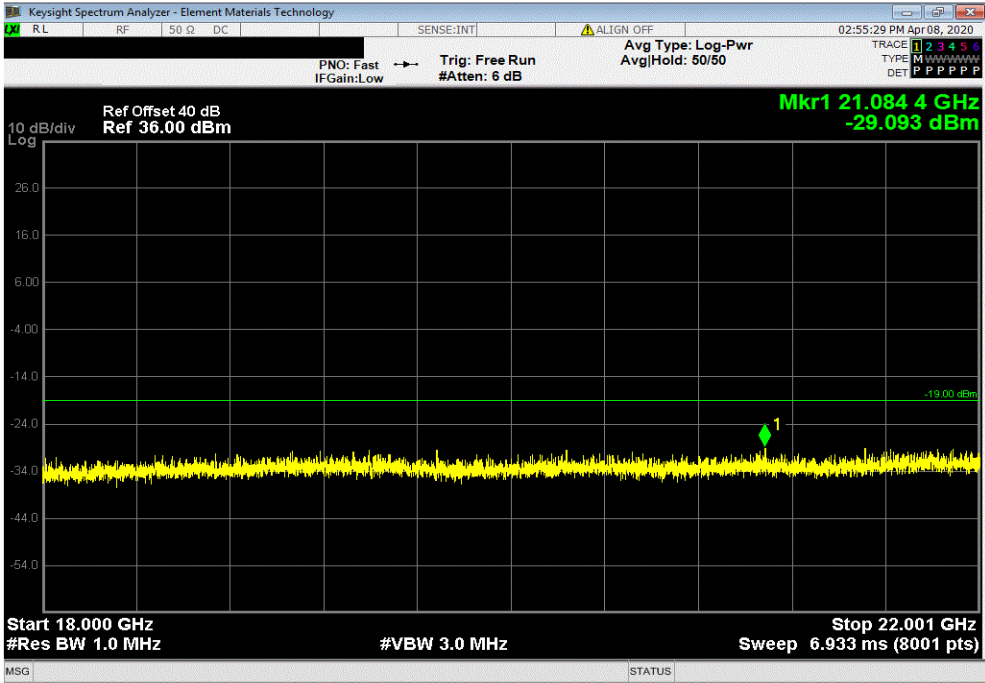
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz						
				Value (dBm)	Limit (dBm)	Result
				-37.312	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 5 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz						
				Value (dBm)	Limit (dBm)	Result
				-29.093	-19	Pass

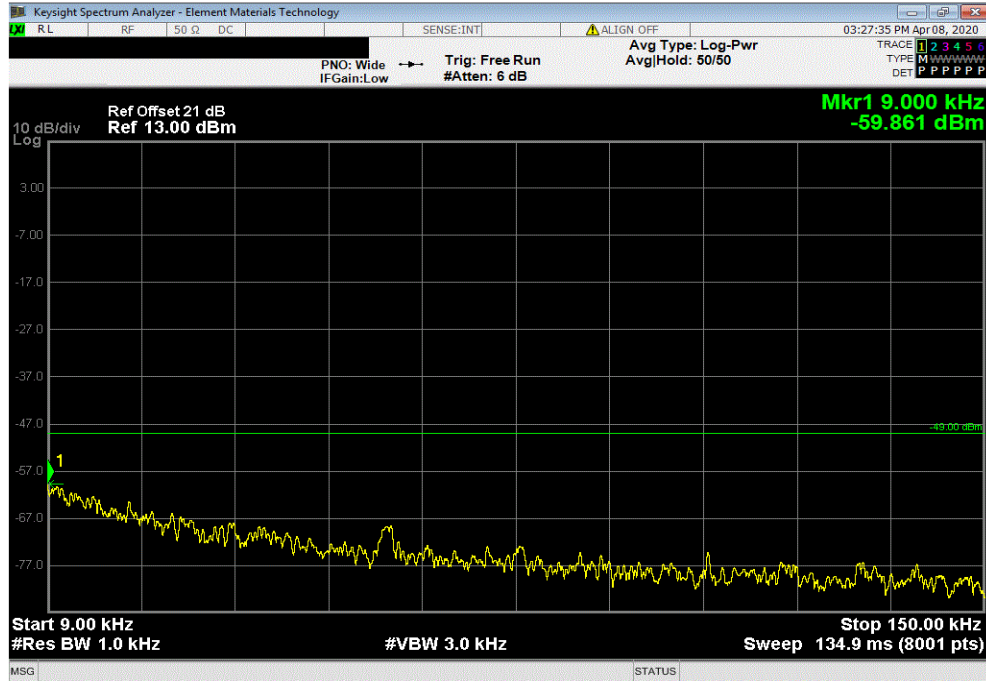


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2

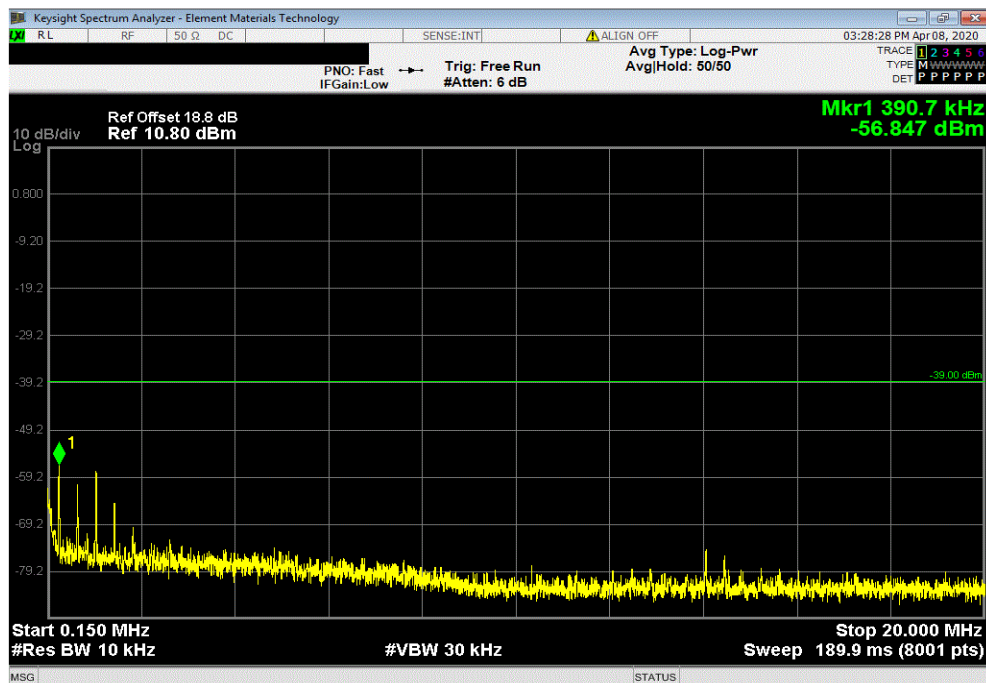


XMI 2020.03.25.0

Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.861	-49	Pass



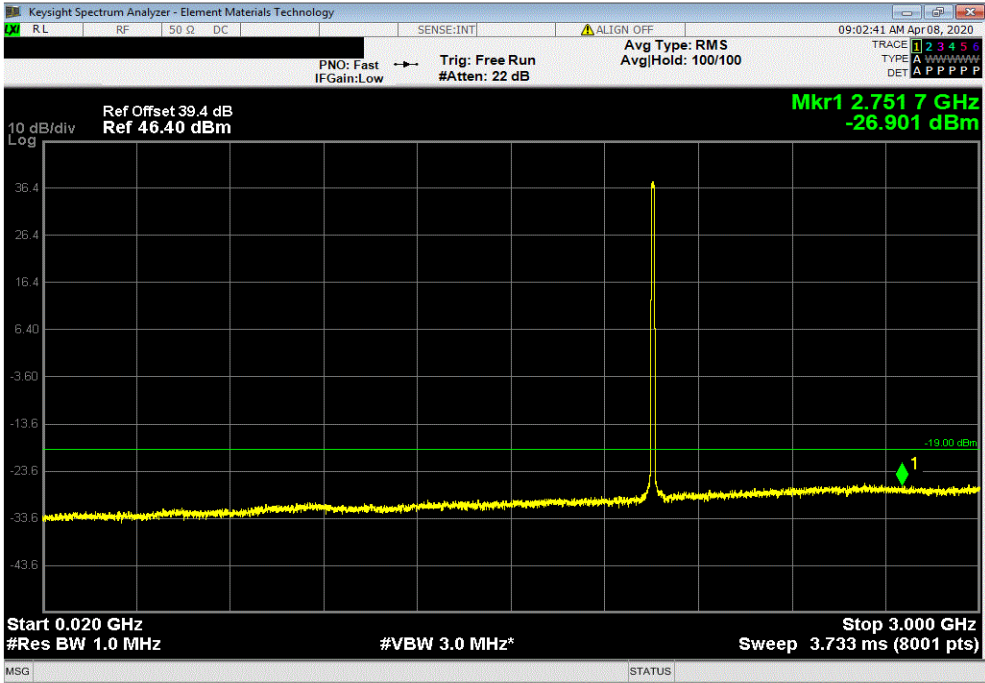
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-56.847	-39	Pass



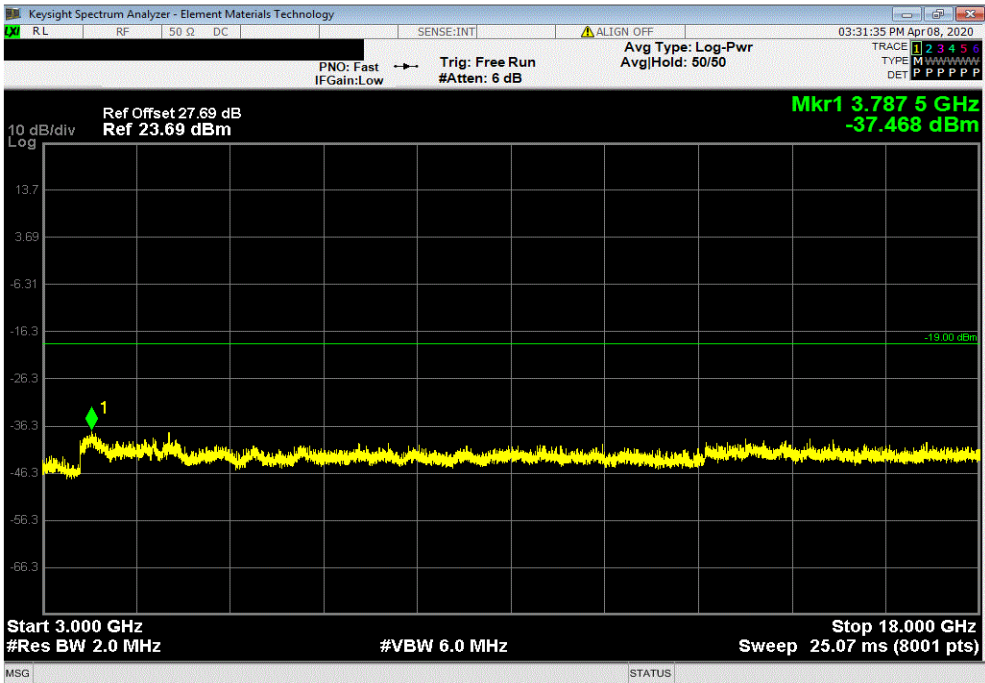
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-26.901	-19	Pass



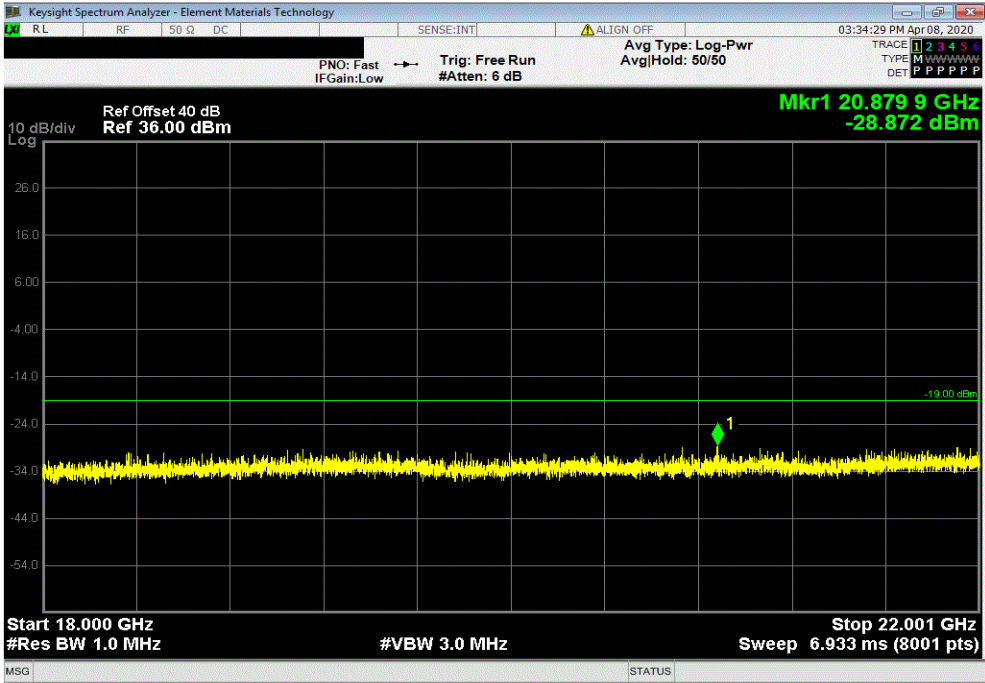
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz						
				Value (dBm)	Limit (dBm)	Result
				-37.468	-19	Pass



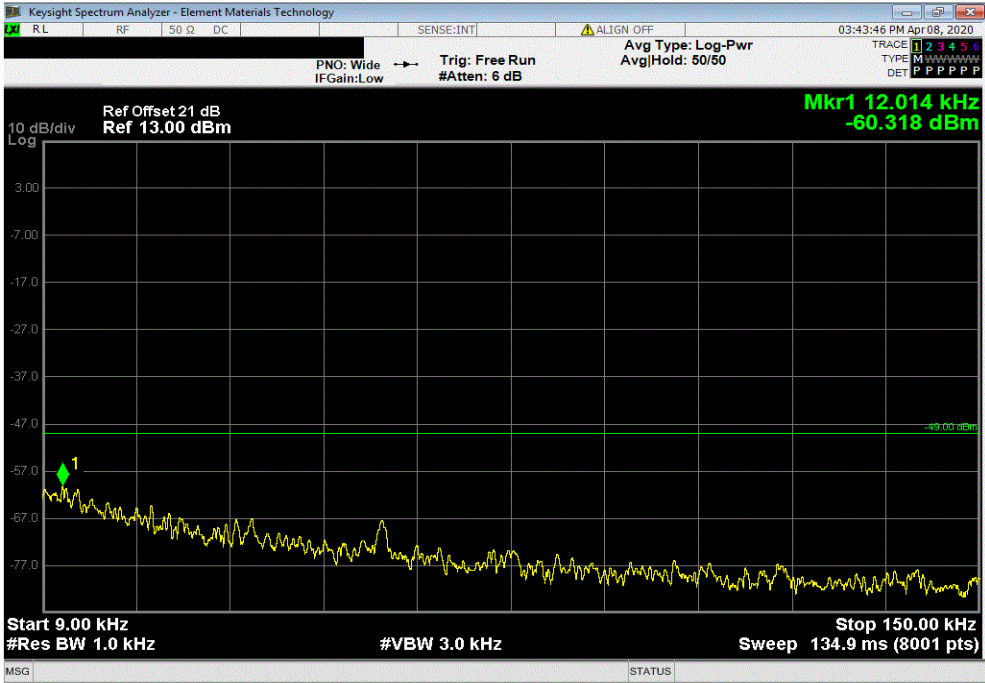
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 10 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz						
				Value (dBm)	Limit (dBm)	Result
				-28.872	-19	Pass



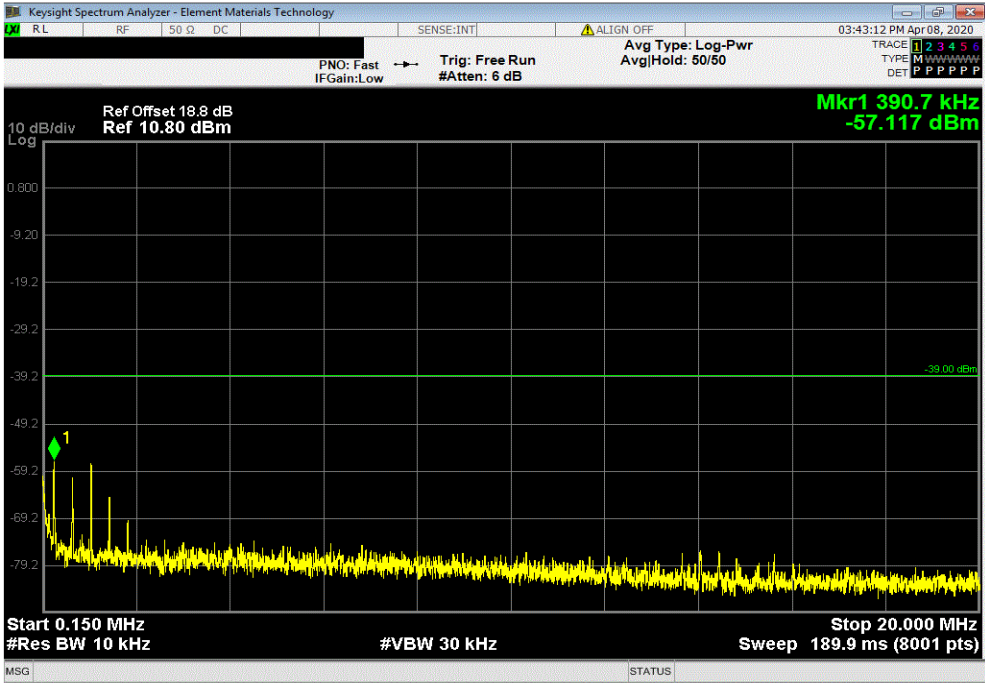
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz						
				Value (dBm)	Limit (dBm)	Result
				-60.318	-49	Pass



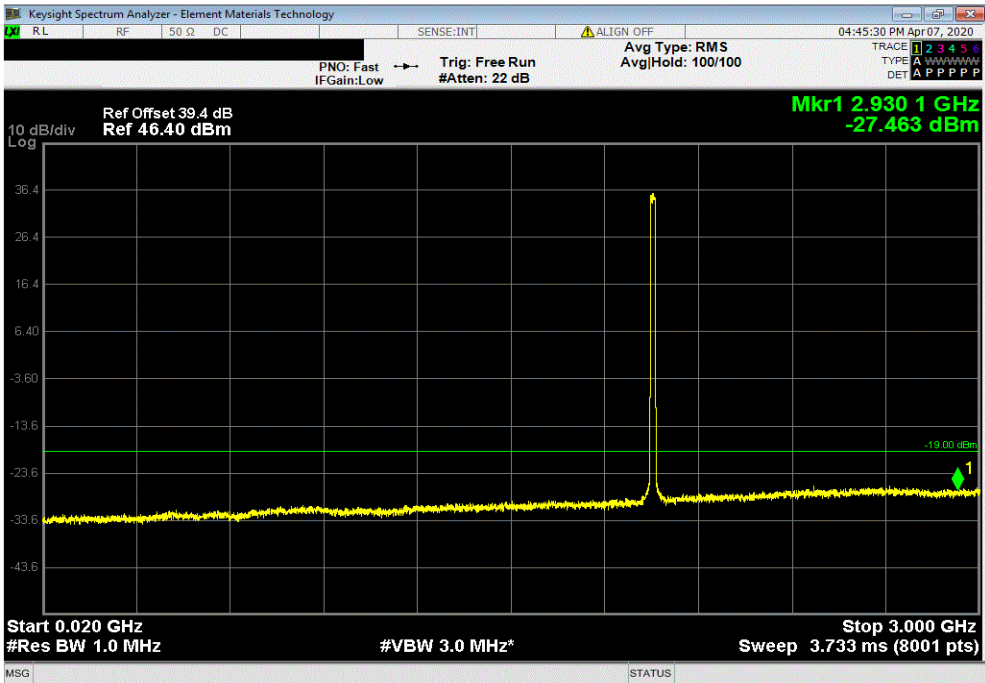
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-57.117	-39	Pass



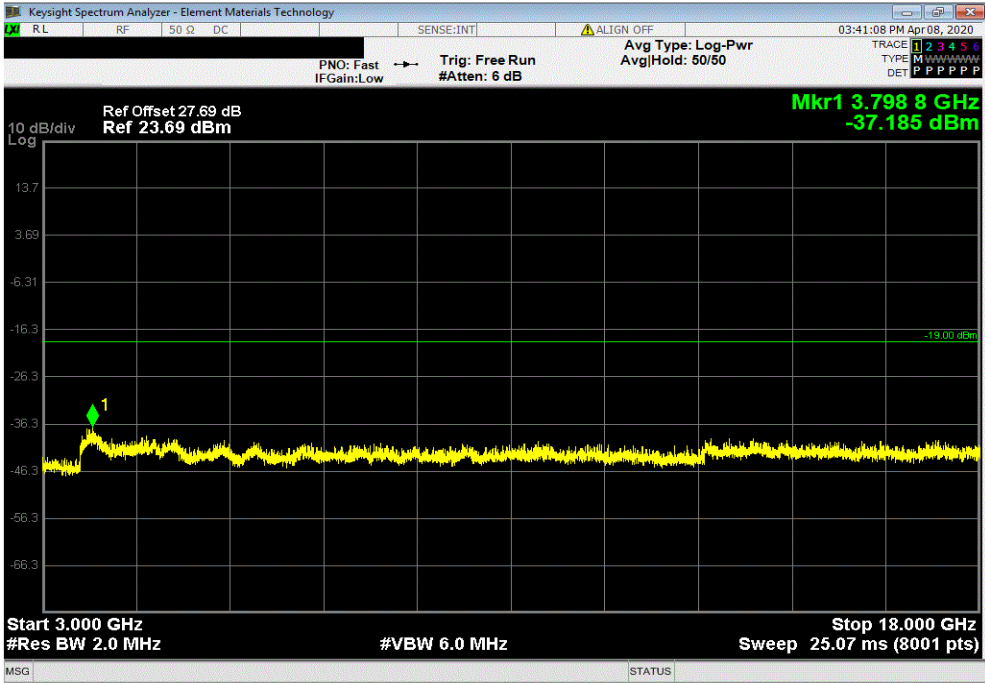
Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-27.463	-19	Pass



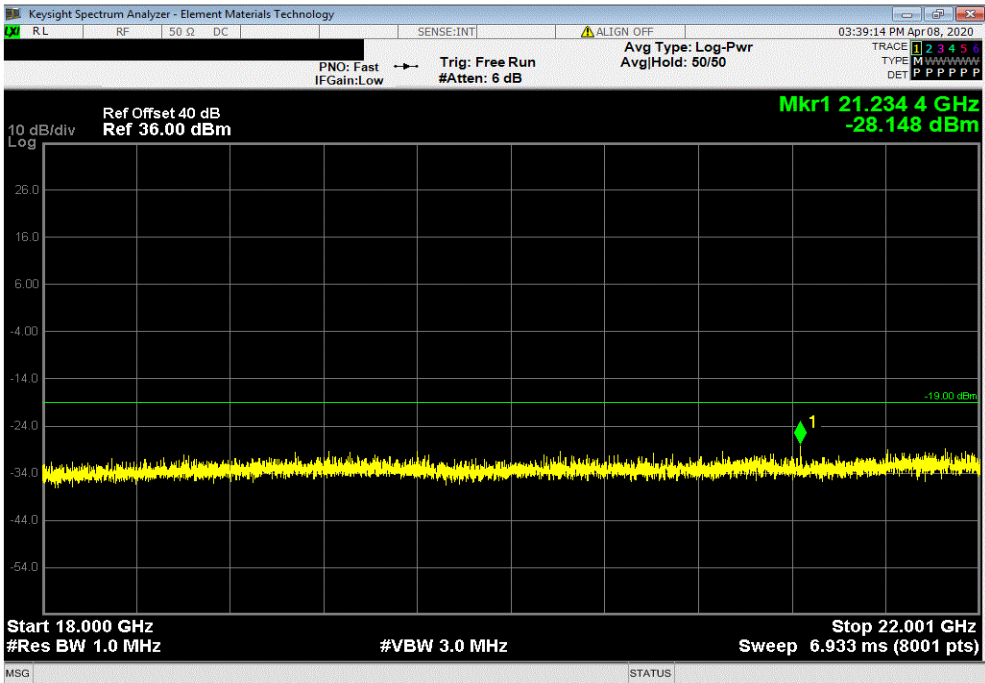
SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz						
				Value (dBm)	Limit (dBm)	Result
				-37.185	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 15 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz						
				Value (dBm)	Limit (dBm)	Result
				-28.148	-19	Pass

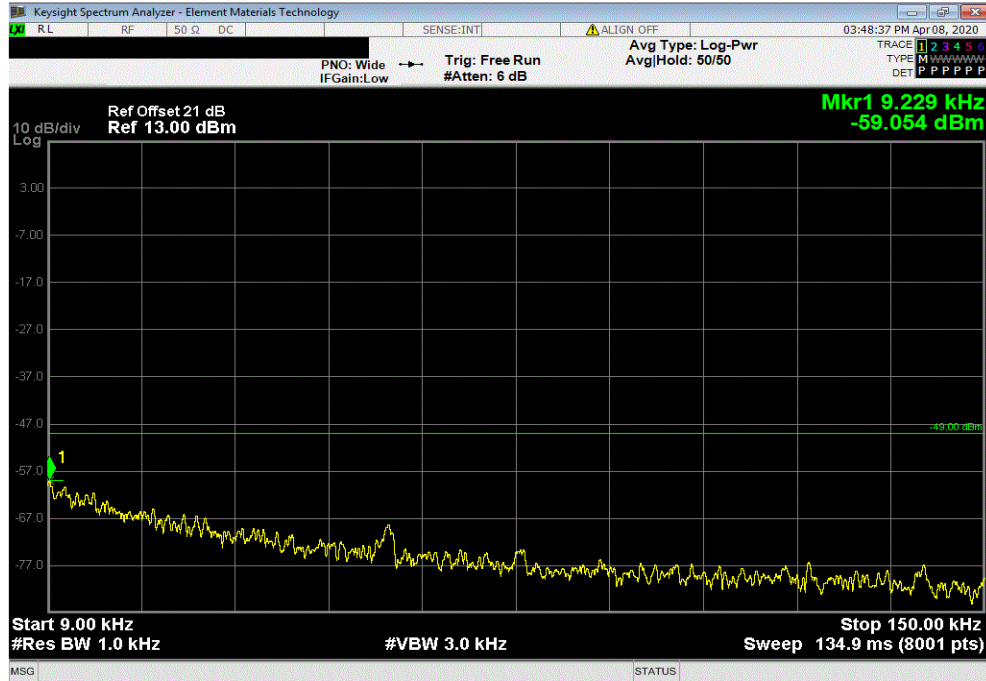


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS BAND 2

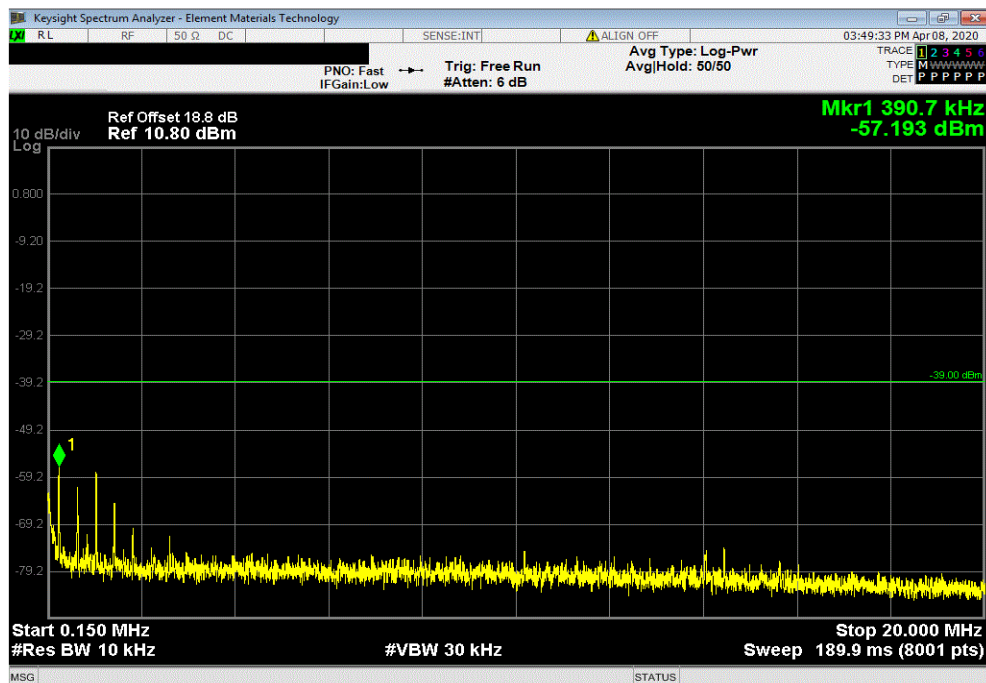


XMI 2020.03.25.0

Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 1, 9 kHz - 150 kHz						
				Value (dBm)	Limit (dBm)	Result
				-59.054	-49	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 2, 150 kHz - 20 MHz						
				Value (dBm)	Limit (dBm)	Result
				-57.193	-39	Pass

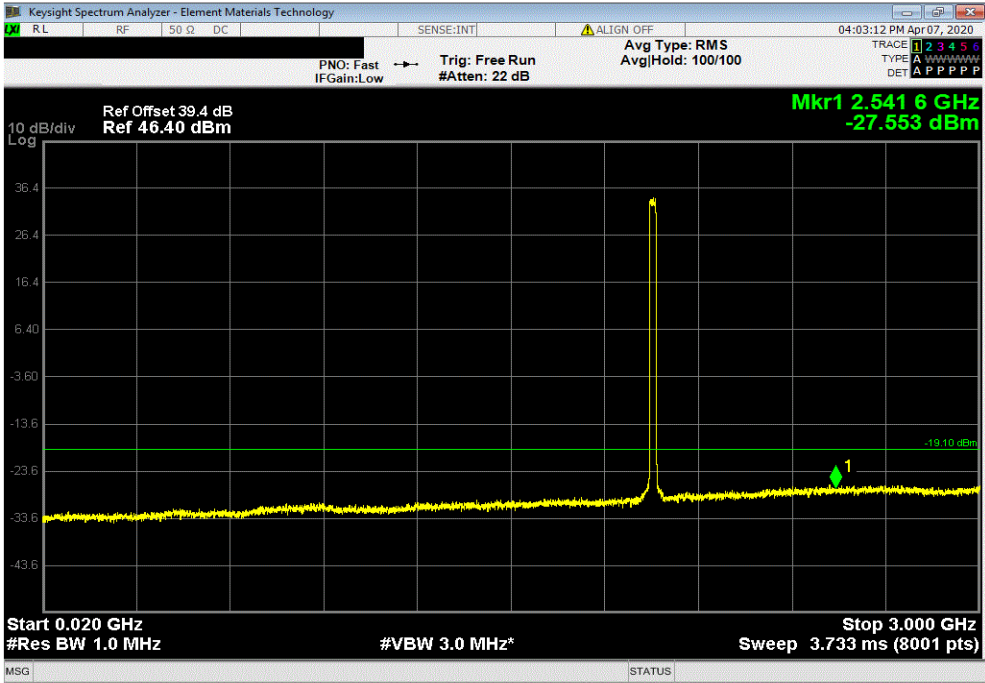


SPURIOUS EMISSIONS AT THE ANTENNA TERMINALS

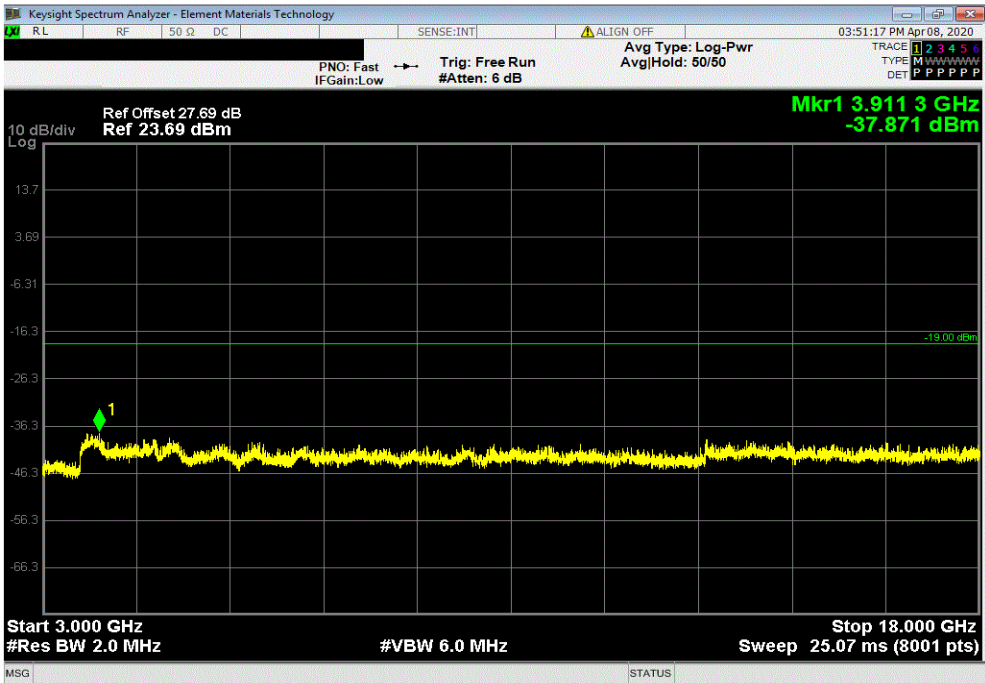
BAND 2



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 3, 20 MHz - 3 GHz						
				Value (dBm)	Limit (dBm)	Result
				-27.553	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 4, 3 GHz - 18 GHz						
				Value (dBm)	Limit (dBm)	Result
				-37.871	-19	Pass



Band 2, 1930 MHz - 1990 MHz, 5G, Port 7, 20 MHz Bandwidth, 256-QAM Modulation, Mid Channel, Range 5, 18 GHz - 22 GHz							
					Value (dBm)	Limit (dBm)	Result
					-28.611	-19	Pass

