

SPURIOUS CONDUCTED EMISSIONS

LTE



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 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 27 GHz. The 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 KDB 971168 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 the frequency band after the first 1.0 MHz bands immediately outside and adjacent to the frequency block.

RF conducted emissions testing was performed only on one port. The AZHL antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in output power 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.

Per FCC Part 27.53(m)(2), the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The BTS may operate as a 8 port MIMO transmitter with transmitter outputs connected to four cross-polarized antennas [four transmitter outputs are connected to (+) radiators and four transmitter outputs are connected to (-) radiators]. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01, ANSI C63.26-2015 section 6.4.6.3 b)2) and KDB 662911 D02v01 page 3 example (2) since the transmitter outputs to each antenna are 90 degree-phase shifted relative to each other (cross-polarized radiators).

Per FCC 27.53(m)(6), "Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.....A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified)".

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.: -49dBm = -19dBm -10log(1MHz/1kHz)]. 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.: -39dBm = -19dBm -10log(1MHz/10kHz)]. The required limit of -19dBm with a RBW of ≥ 1 MHz was used for all other frequency ranges. (See ANSI C63.26-2015 paragraph 5.7.2a for details on the Limit/RBW scaling method)

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TstTx 2019.08.30.0 XMIT 2020.12.30.0

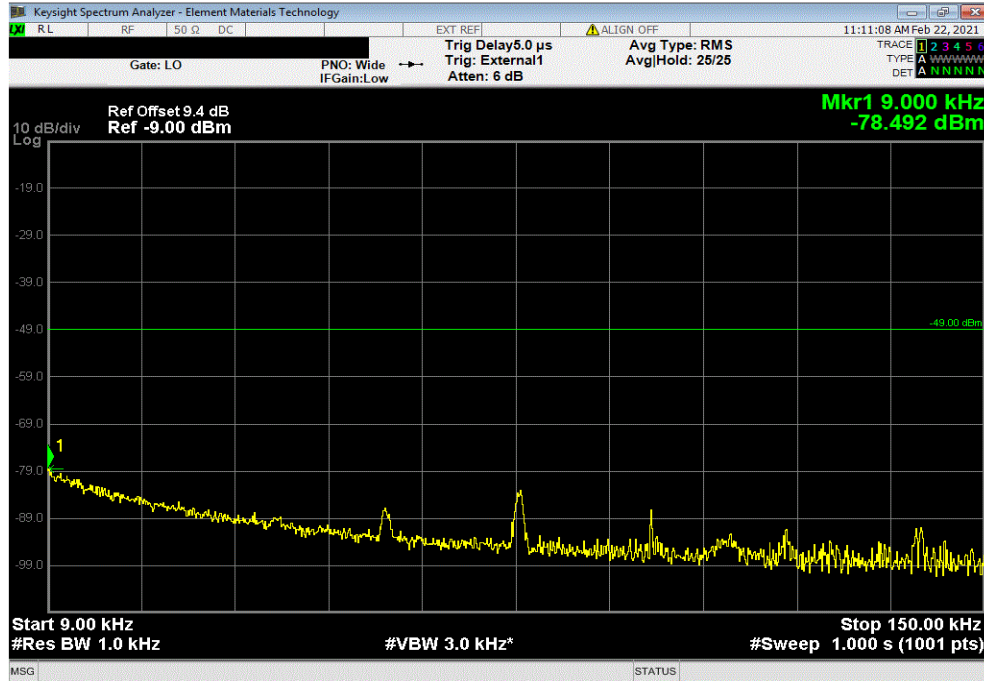
EUT: AZHL		Work Order: NOKI0018				
Serial Number: YK203400016		Date: 22-Feb-21				
Customer: Nokia Solutions and Networks		Temperature: 23.6 °C				
Attendees: John Rattanaovong, Mitchell Hill, David Le		Humidity: 14.9% RH				
Project: None		Barometric Pres.: 1037 mbar				
Tested by: Mark Baytan		Power: 54 VDC				
Job Site: TX05						
TEST SPECIFICATIONS		Test Method				
FCC 27:2021		ANSI C63.26:2015				
COMMENTS						
External 1 gating was set using a trig delay = 5.0us and a gate length = 6.786ms. Reference level offset adjusted to include coax cables, DC blocks, attenuators, and band pass filters. This was accounted for based on the frequency range being tested. The carrier power was set to maximum for all testing.						
DEVIATIONS FROM TEST STANDARD						
None						
Configuration #	1, 2, 3, 4	Signature 				
		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result
4G LTE, Band 41, 2496 MHz - 2690 MHz						
Port 1						
LTE10 (10MHz)						
QPSK						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-78.49	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.16	-78.96	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3797.52	-28.25	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	4780.15	-44.06	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	13607.85	-43.03	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26227.80	-47.57	-19	Pass
16QAM						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-79.00	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.15	-79.76	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3793.54	-28.13	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	4775.95	-44.07	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	13607.85	-43.12	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26231.40	-47.56	-19	Pass
64QAM						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-77.58	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.15	-78.75	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3802.49	-28.07	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	4779.80	-44.14	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	13610.30	-43.06	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26261.10	-47.55	-19	Pass
256QAM						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-78.50	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.15	-78.84	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3802.49	-28.02	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	4772.80	-44.14	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	13600.15	-42.99	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26250.30	-47.51	-19	Pass
LTE15 (15MHz)						
256QAM						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-79.04	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.15	-79.37	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3801.50	-28.00	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	13601.90	-43.05	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	4787.5	-44.12	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26259.75	-47.6	-19	Pass
LTE20 (20MHz)						
256QAM						
	Mid Channel 2593 MHz	9 kHz - 150 kHz	0.01	-78.71	-49	Pass
	Mid Channel 2593 MHz	150 kHz - 20 MHz	0.15	-79.15	-39	Pass
	Mid Channel 2593 MHz	20 MHz - 4 GHz	3802.49	-28.03	-19	Pass
	Mid Channel 2593 MHz	4 GHz - 11 GHz	4785.05	-44.10	-19	Pass
	Mid Channel 2593 MHz	11 GHz - 18 GHz	13602.95	-42.99	-19	Pass
	Mid Channel 2593 MHz	18 GHz - 27 GHz	26236.35	-47.47	-19	Pass

SPURIOUS CONDUCTED EMISSIONS LTE

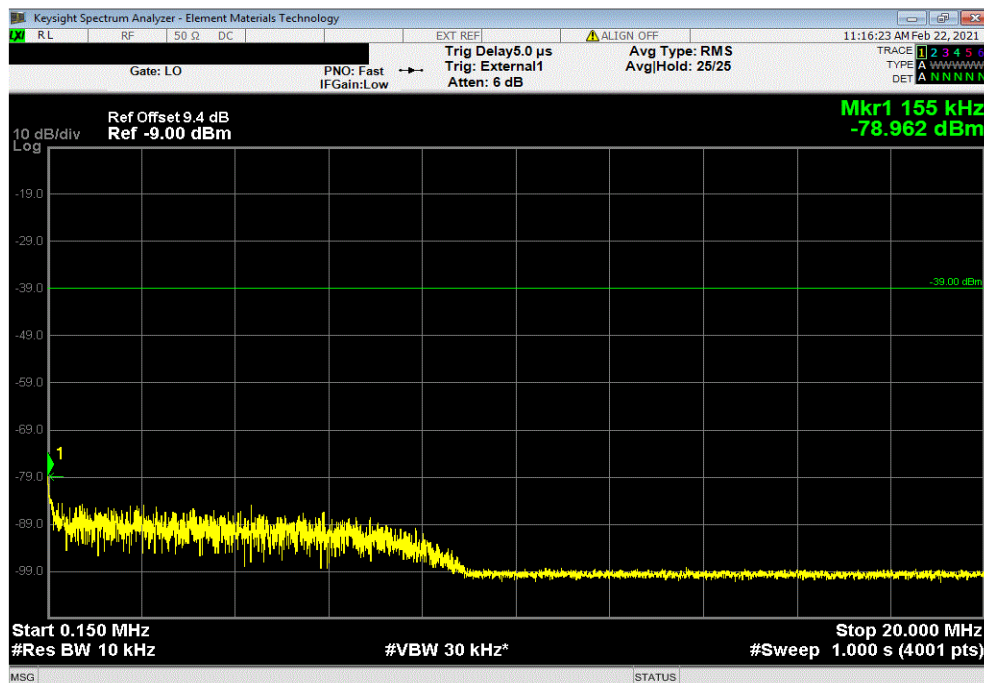


TbTx 2019.08.30.0 XMit 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-78.49	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.16	-78.96	-39	Pass	

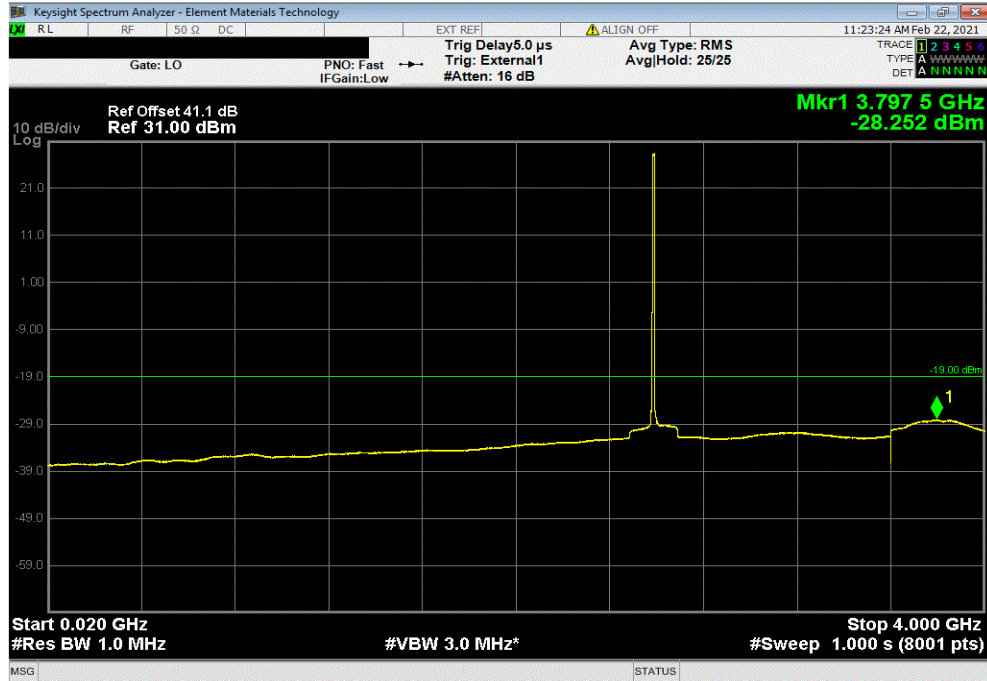


SPURIOUS CONDUCTED EMISSIONS LTE

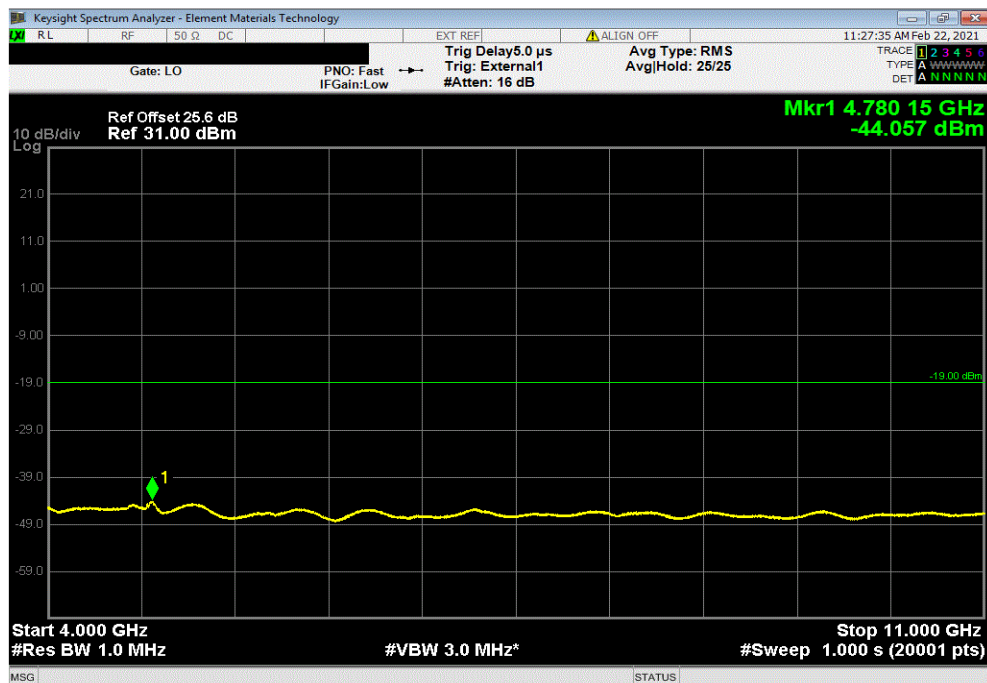


TbTx 2019.08.30.0 XMTx 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3797.52	-28.25	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	4780.15	-44.06	-19	Pass	

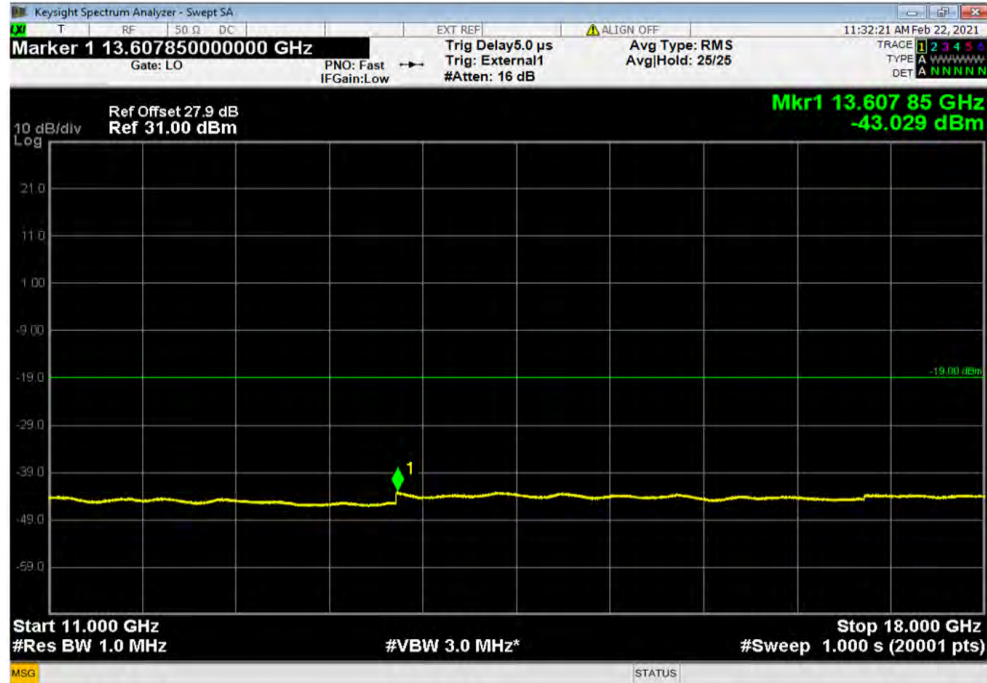


SPURIOUS CONDUCTED EMISSIONS LTE

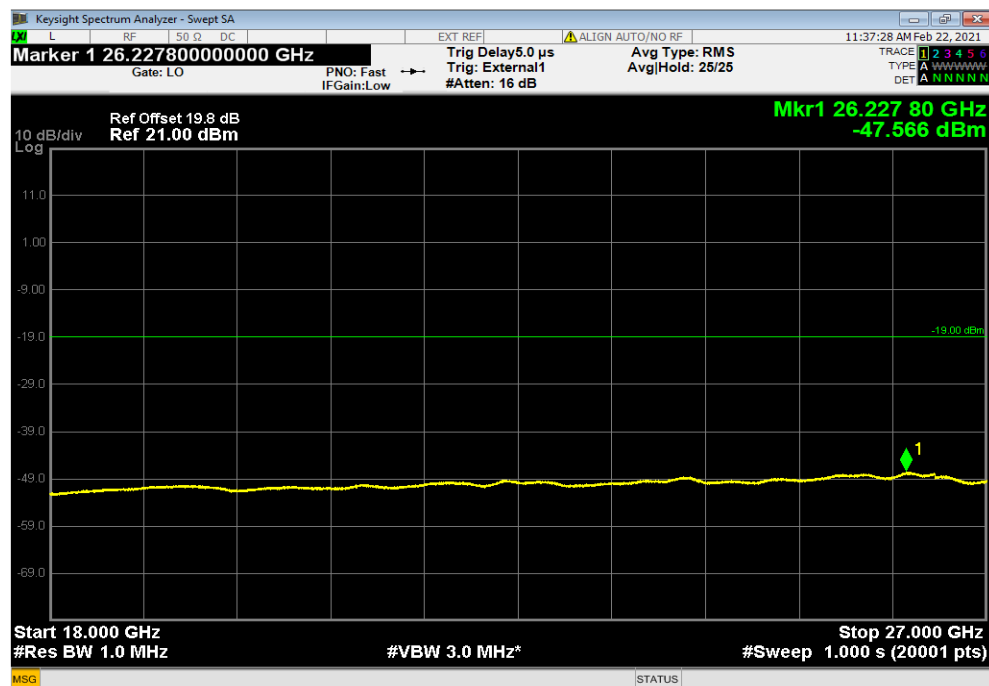


TbTtX 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	13607.85	-43.03	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), QPSK, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26227.80	-47.57	-19	Pass	

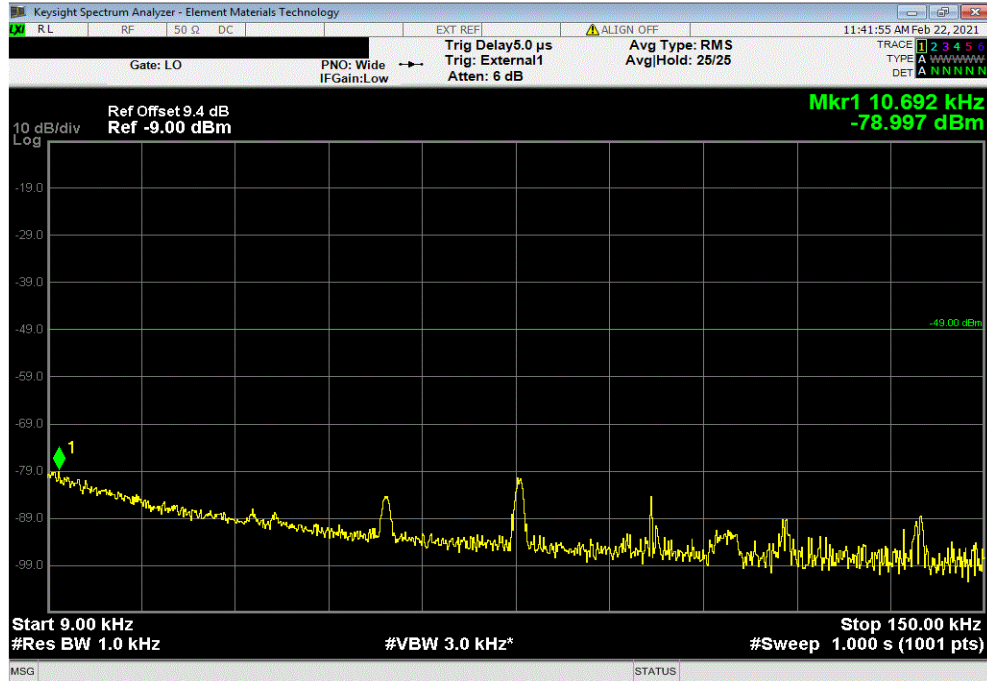


SPURIOUS CONDUCTED EMISSIONS LTE

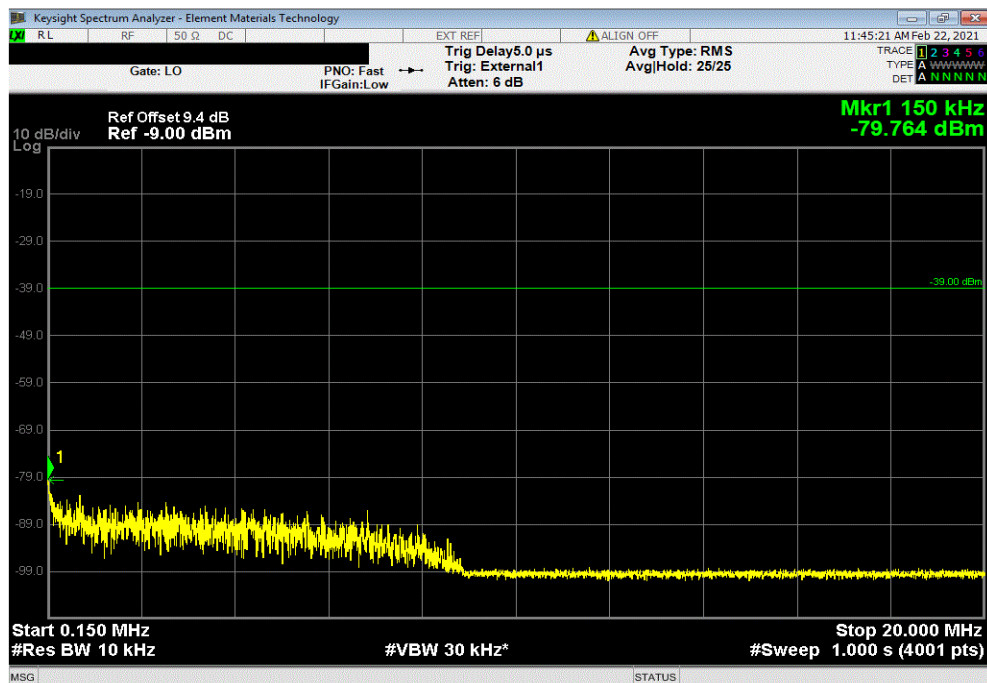


TbTx 2019.08.30.0 XbTx 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-79.00	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.15	-79.76	-39	Pass	

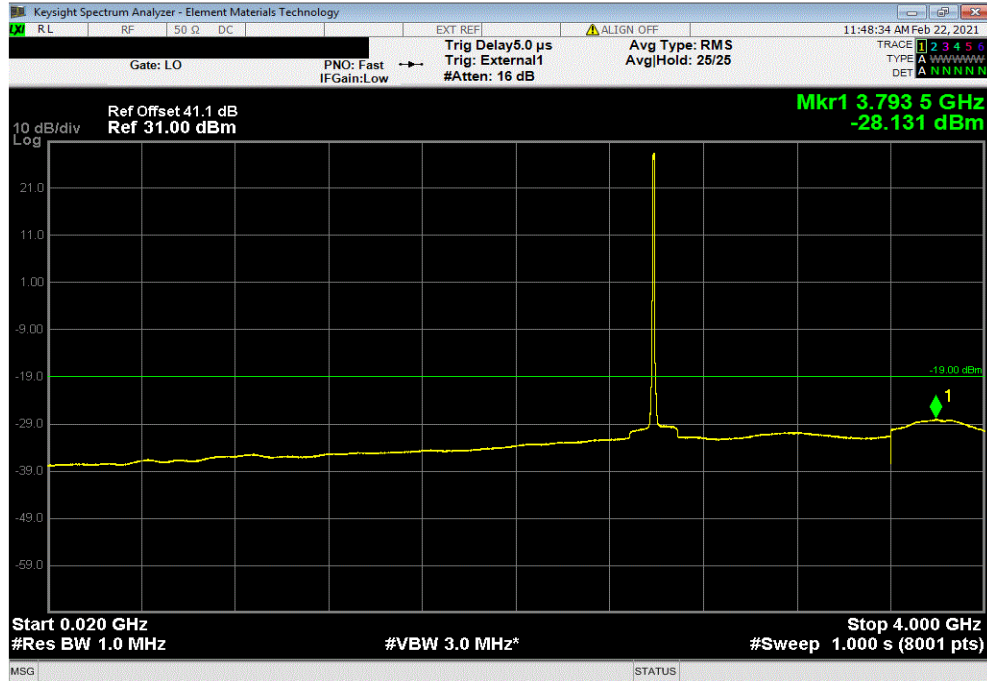


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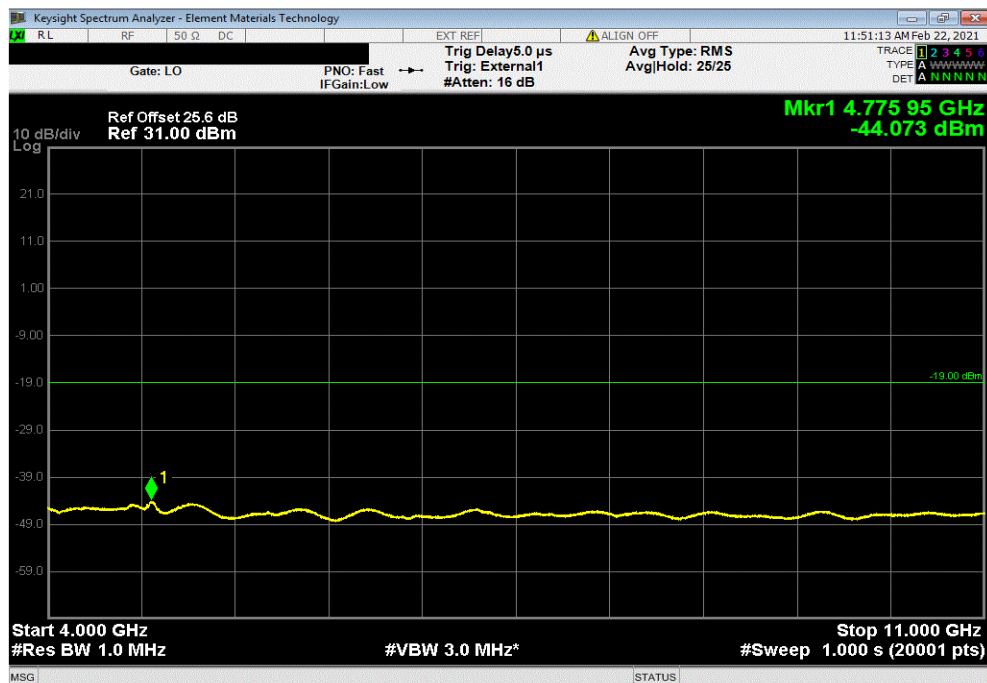


TbTx 2019.08.30.0 XbTx 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3793.54	-28.13	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	4775.95	-44.07	-19	Pass	

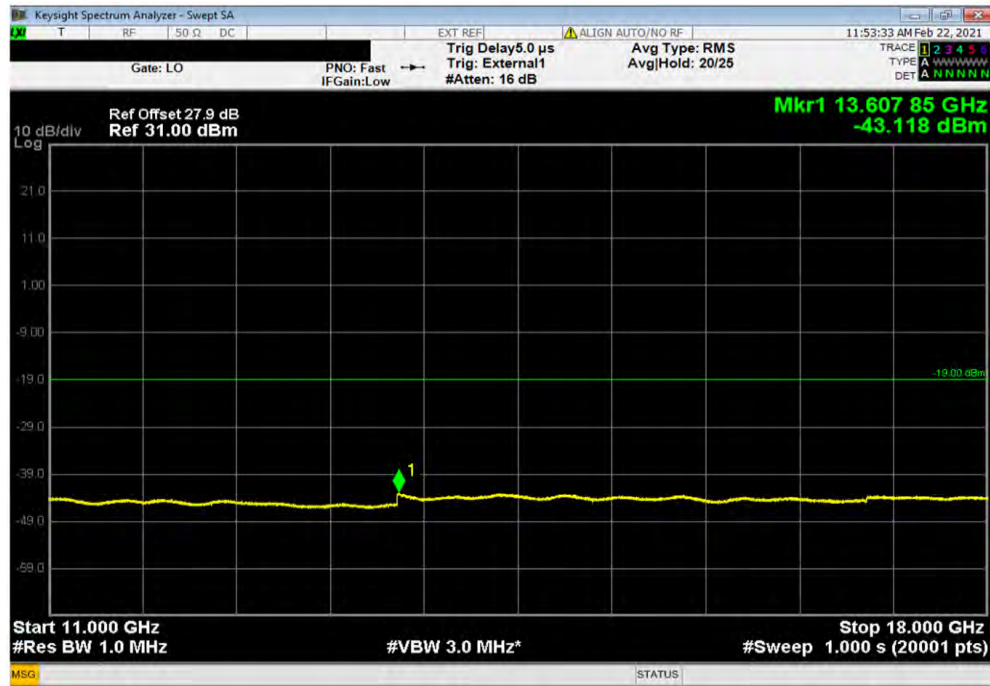


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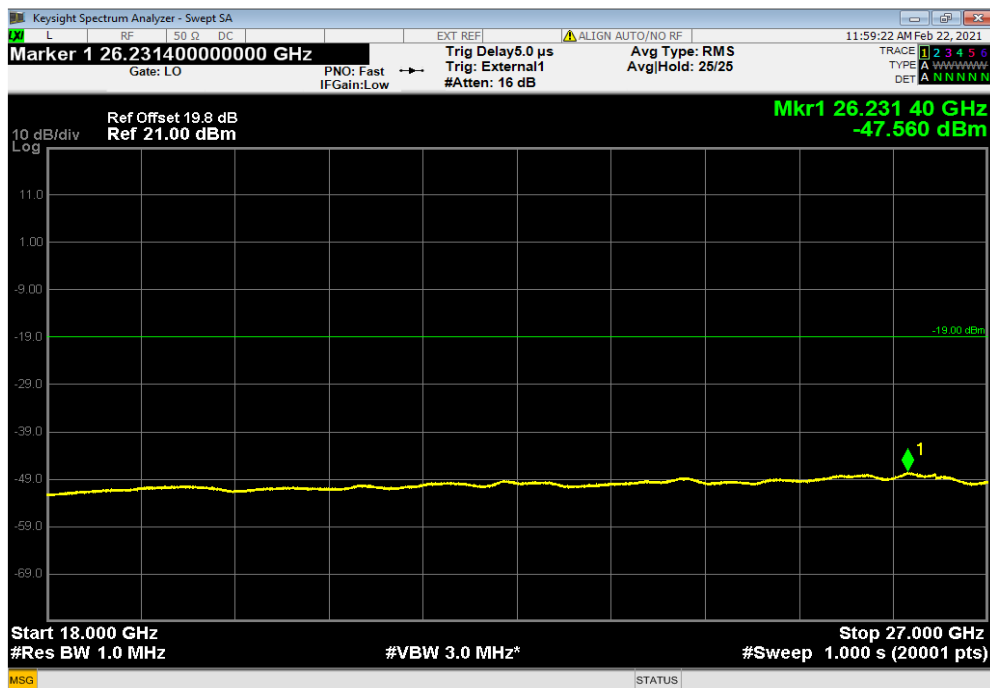


TbTtX 2019.08.30.0 XMit 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	13607.85	-43.12	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 16QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26231.40	-47.56	-19	Pass	

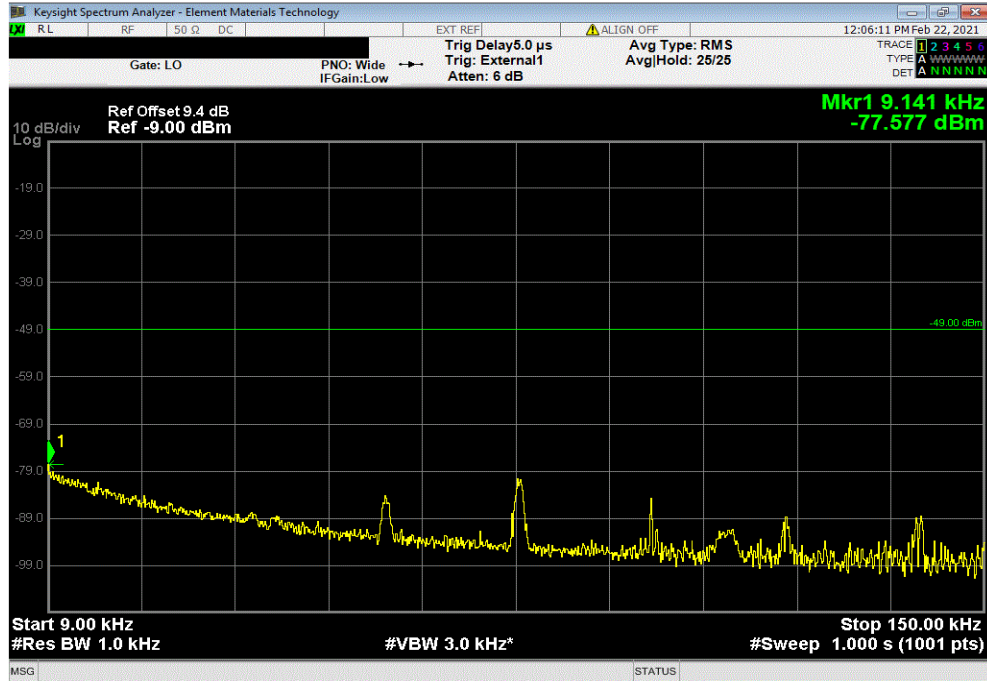


SPURIOUS CONDUCTED EMISSIONS LTE

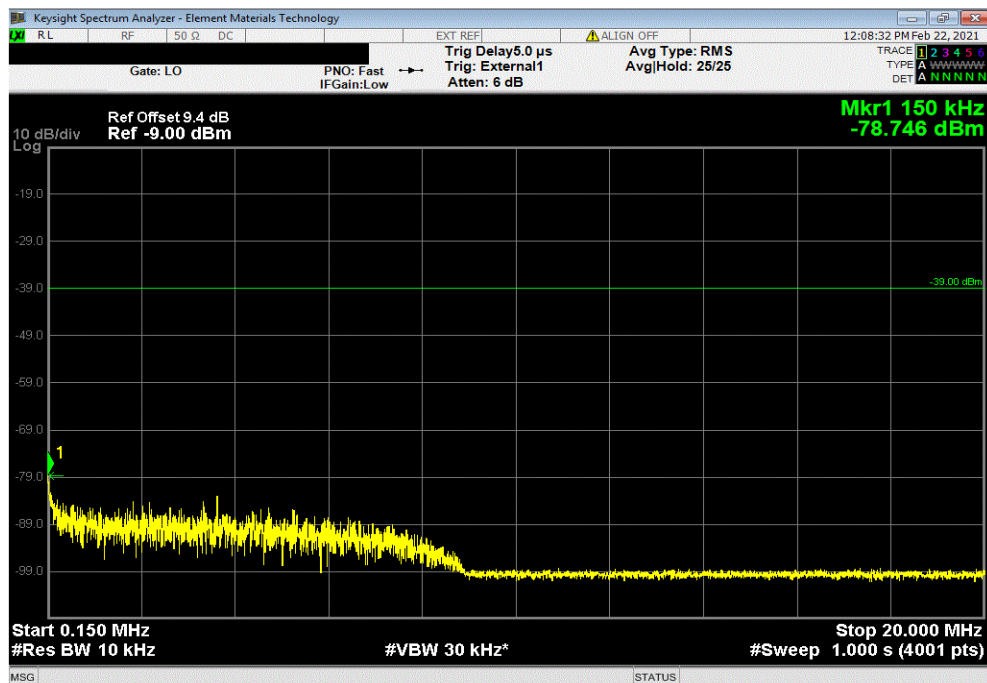


TbTx 2019.08.30.0 XbTx 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-77.58	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.15	-78.75	-39	Pass	

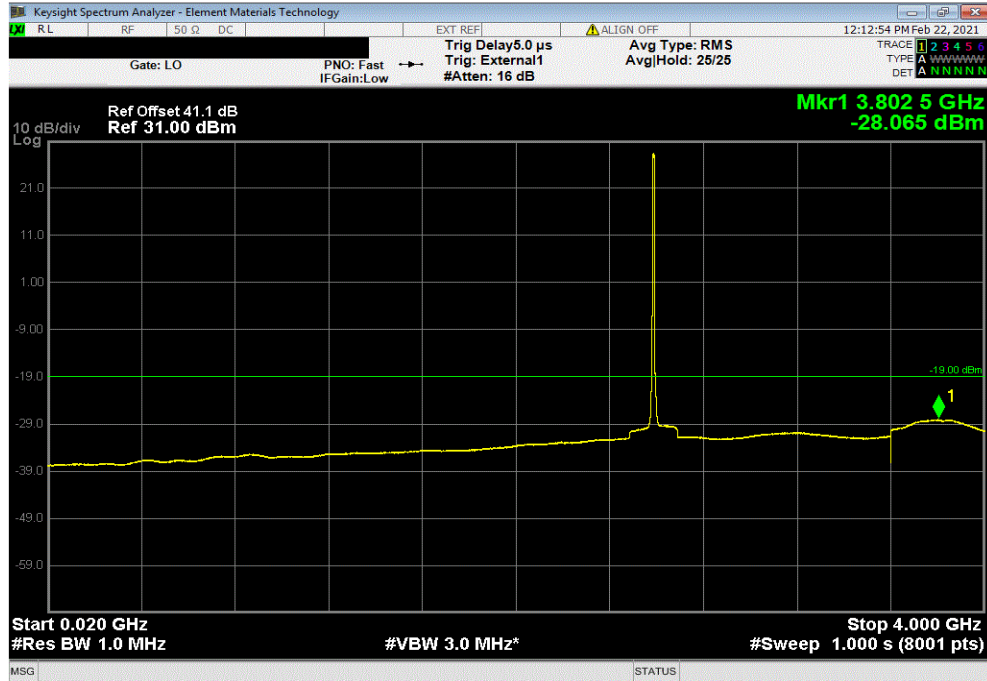


SPURIOUS CONDUCTED EMISSIONS LTE

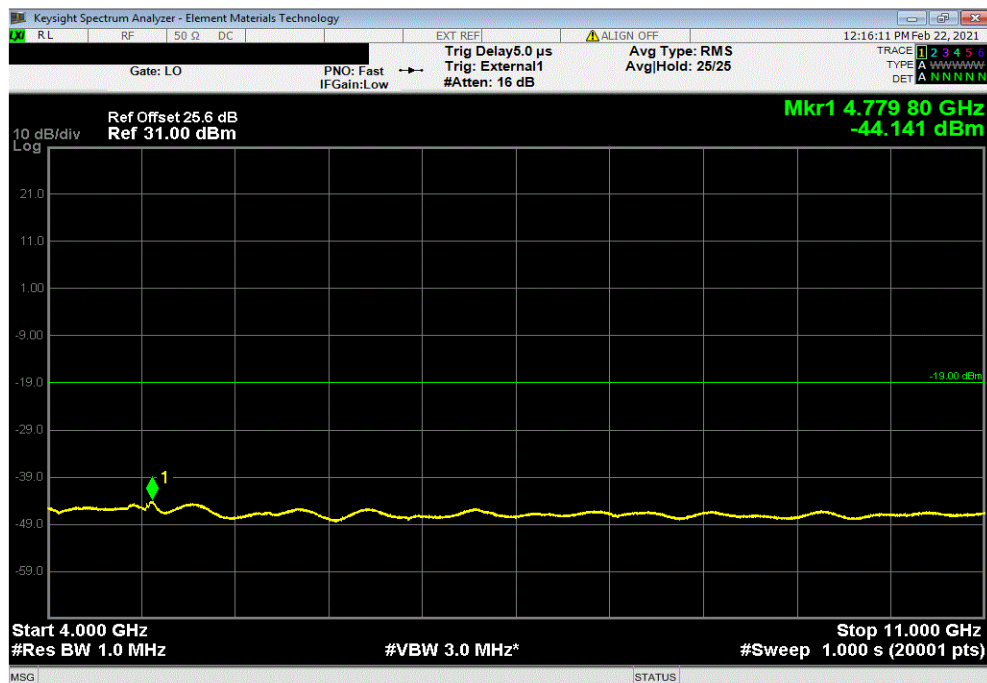


TbTtX 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3802.49	-28.07	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	4779.80	-44.14	-19	Pass	

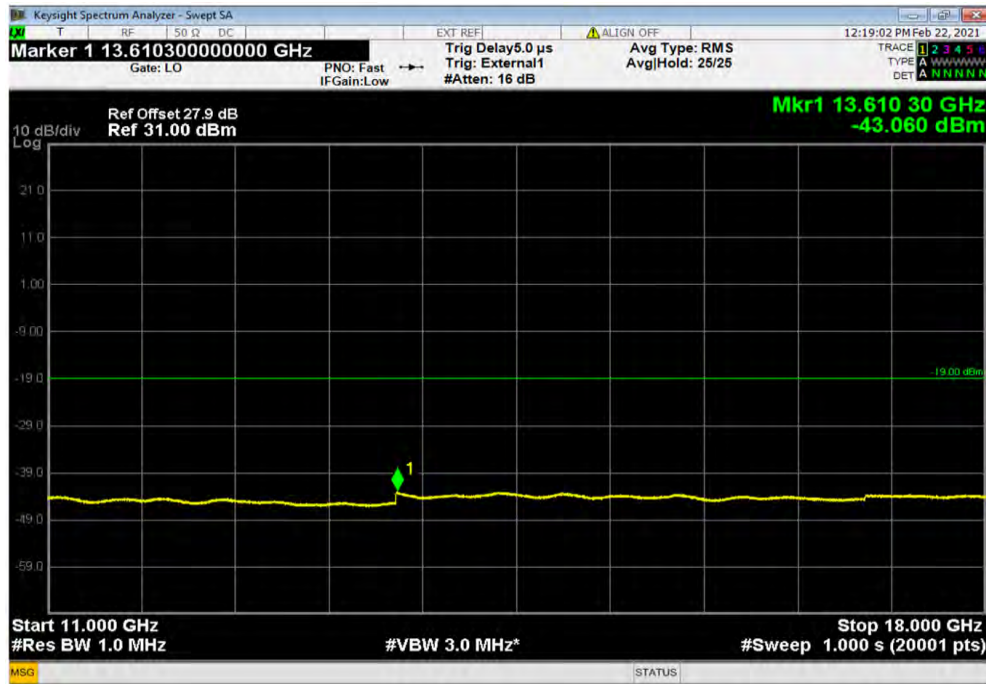


SPURIOUS CONDUCTED EMISSIONS LTE

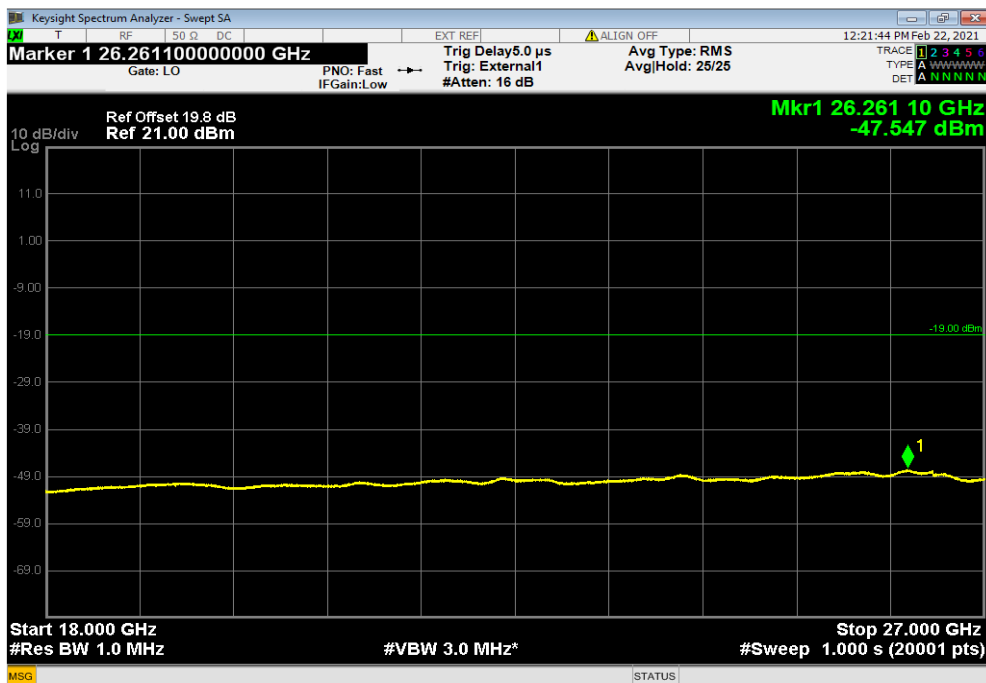


TbTtX 2019.08.30.0 XMit 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	13610.30	-43.06	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 64QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26261.10	-47.55	-19	Pass	

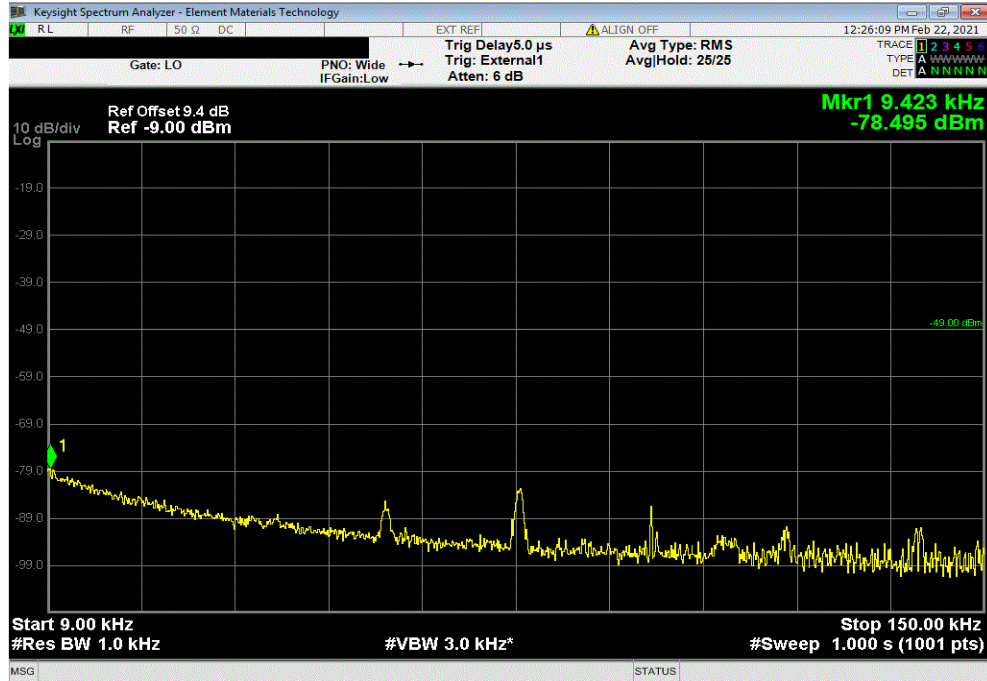


SPURIOUS CONDUCTED EMISSIONS LTE

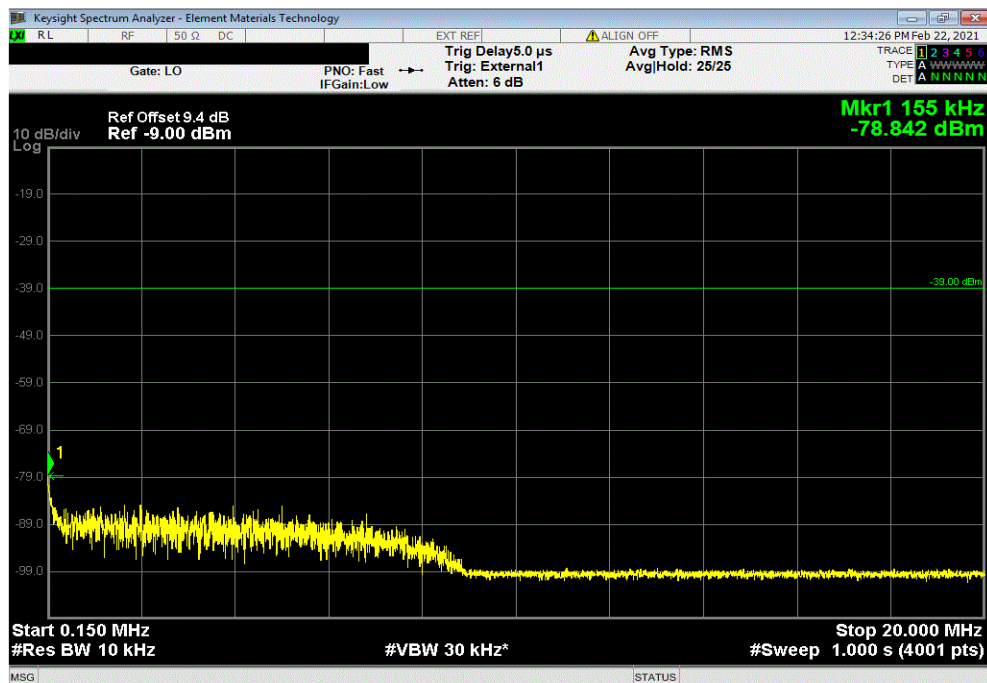


TbTx 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-78.50	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.15	-78.84	-39	Pass	

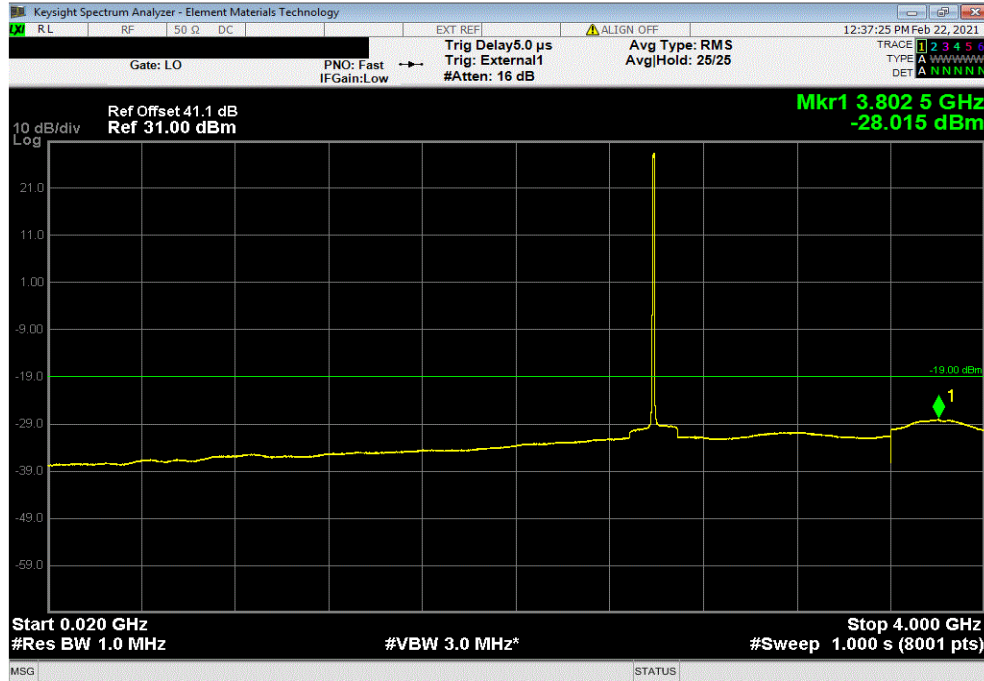


SPURIOUS CONDUCTED EMISSIONS LTE

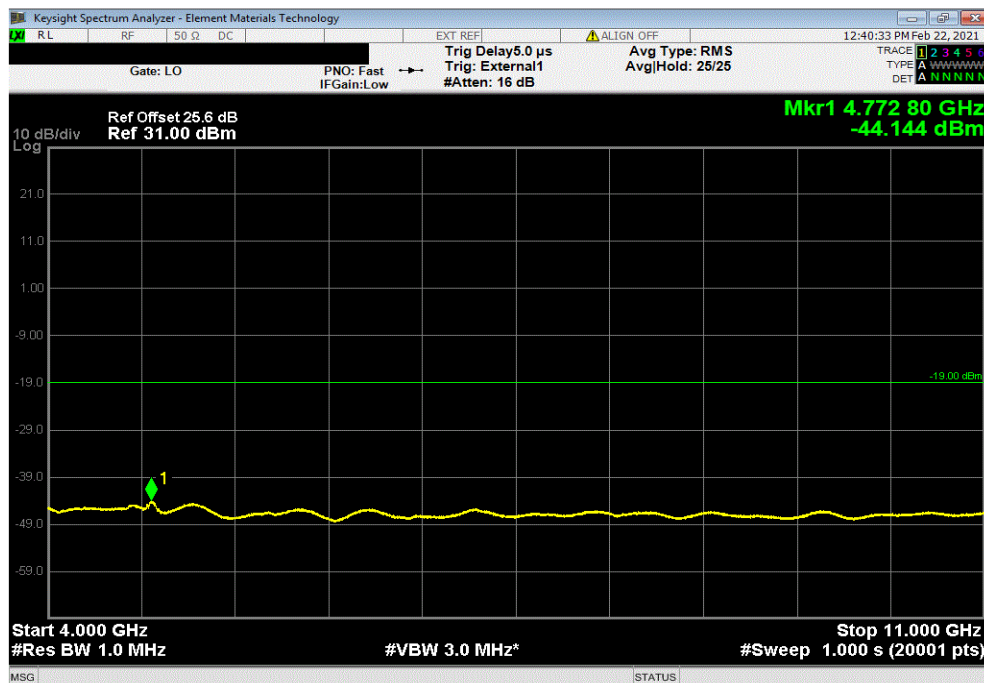


TbTtX 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3802.49	-28.02	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	4772.80	-44.14	-19	Pass	

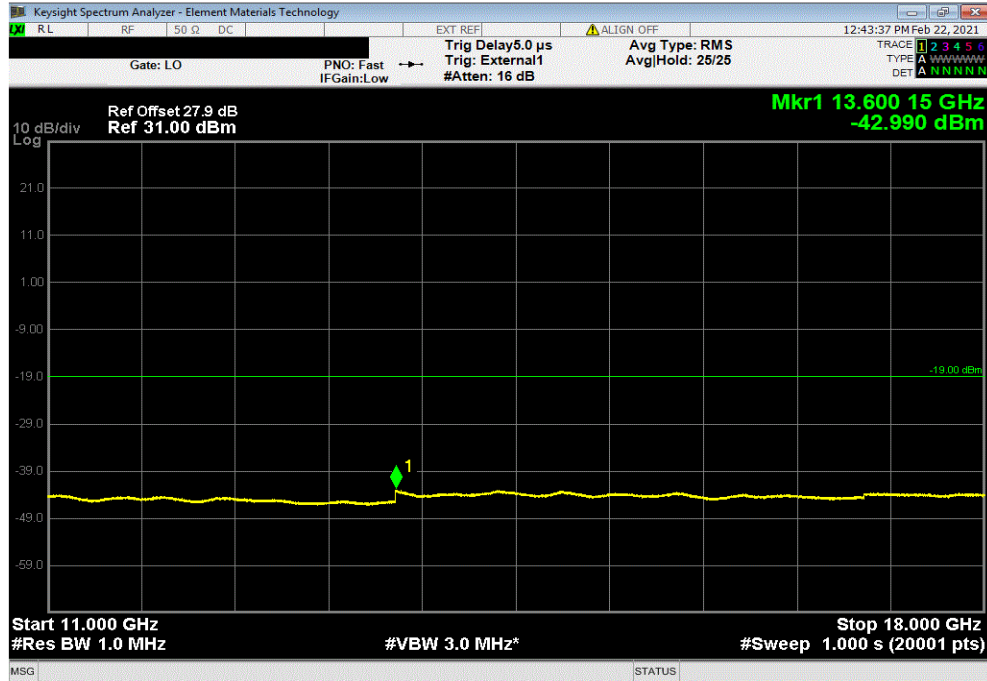


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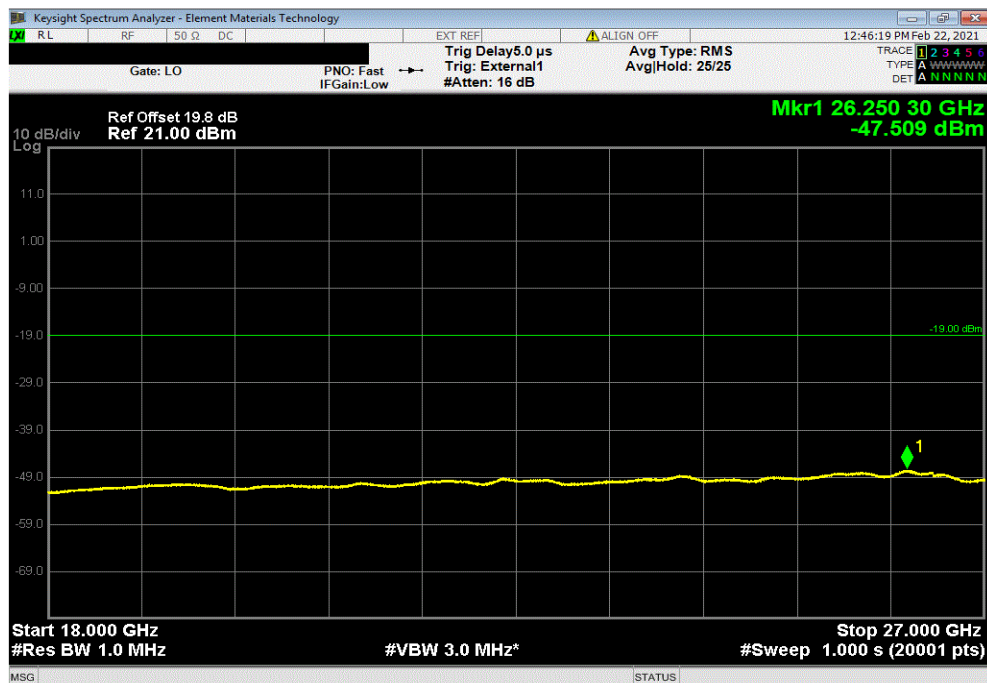


TbTtx 2019.08.30.0 XMit 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	13600.15	-42.99	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE10 (10MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26250.30	-47.51	-19	Pass	

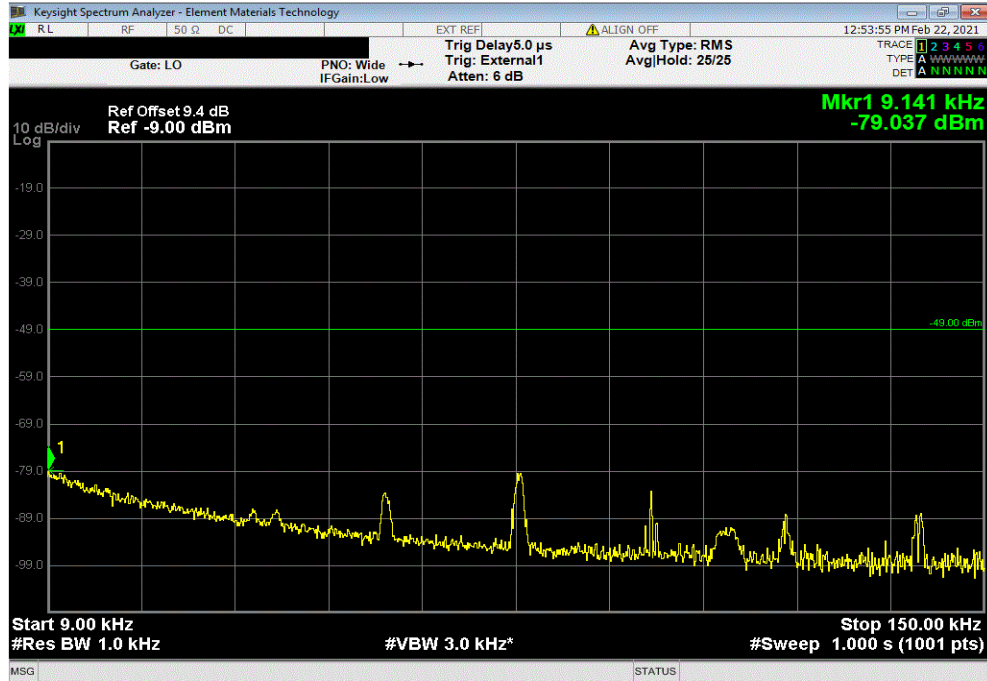


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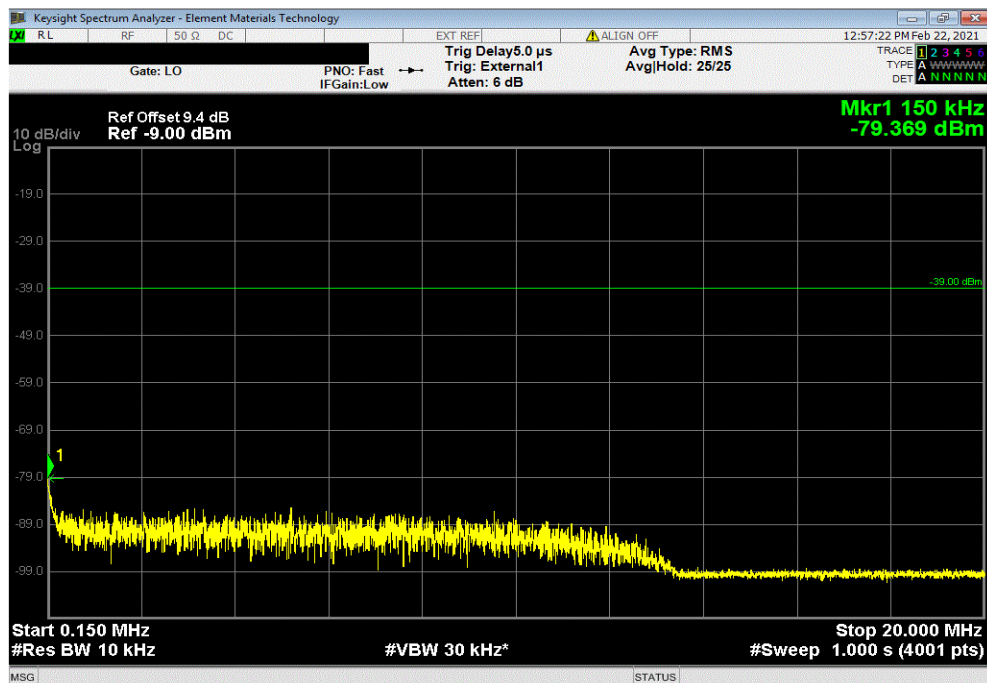


TbTx 2019.08.30.0 XMit 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-79.04	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.15	-79.37	-39	Pass	

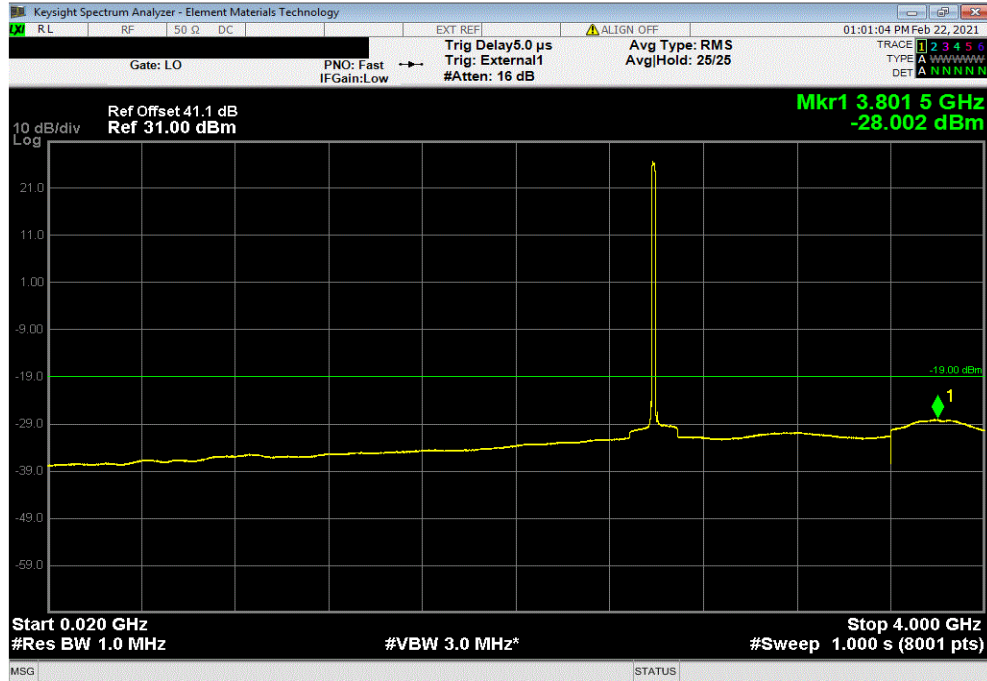


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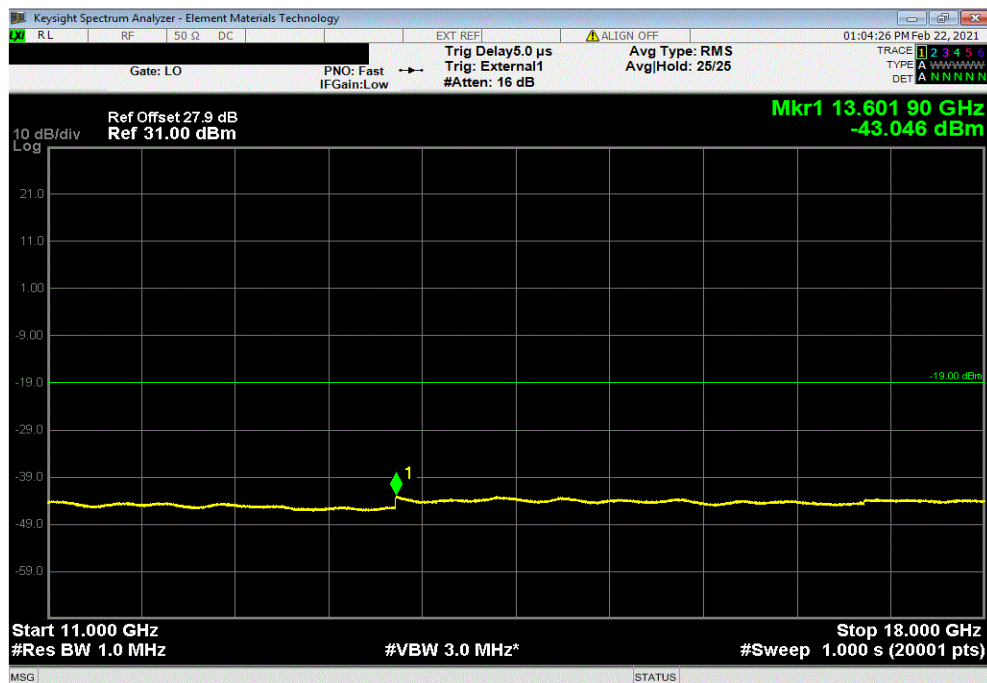


TbTx 2019.08.30.0 XbTx 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3801.50	-28.00	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	13601.90	-43.05	-19	Pass	

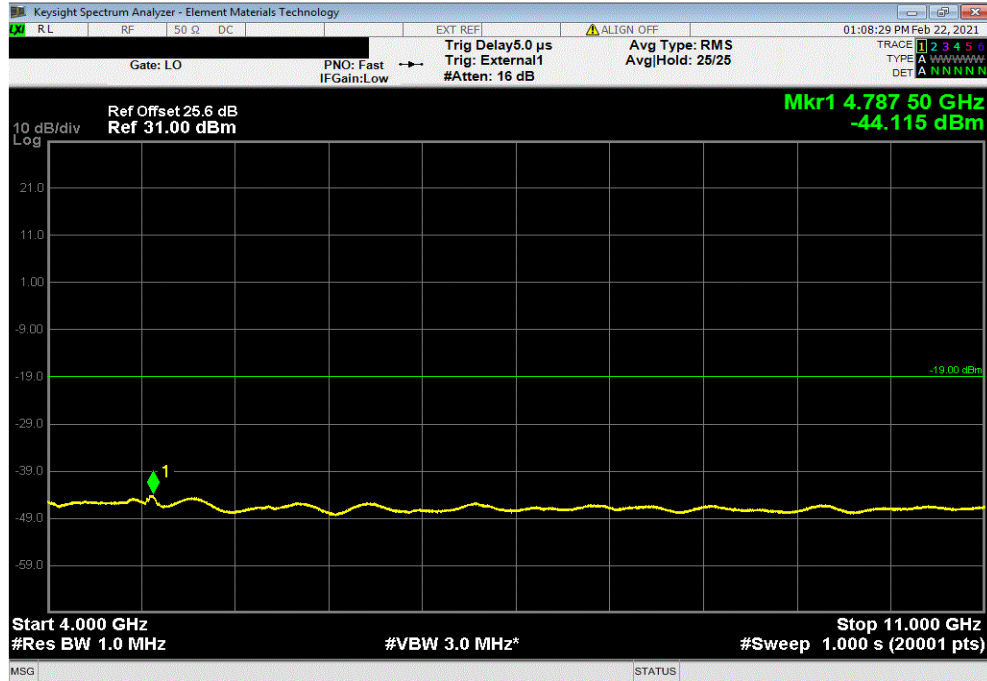


SPURIOUS CONDUCTED EMISSIONS LTE

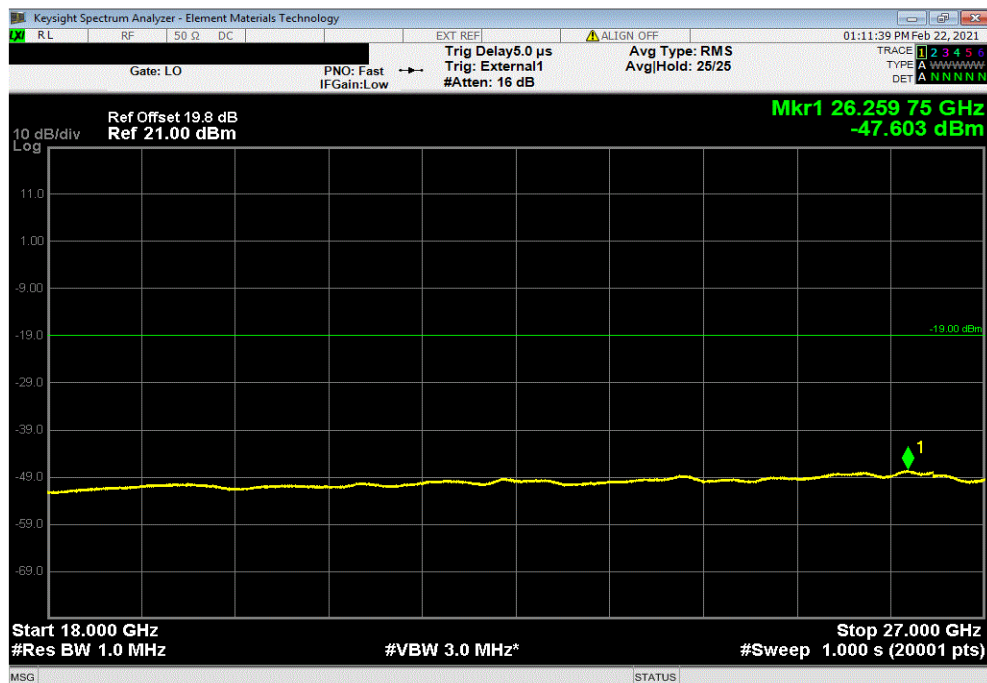


TbTtx 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	4787.5	-44.12	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE15 (15MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26259.75	-47.6	-19	Pass	

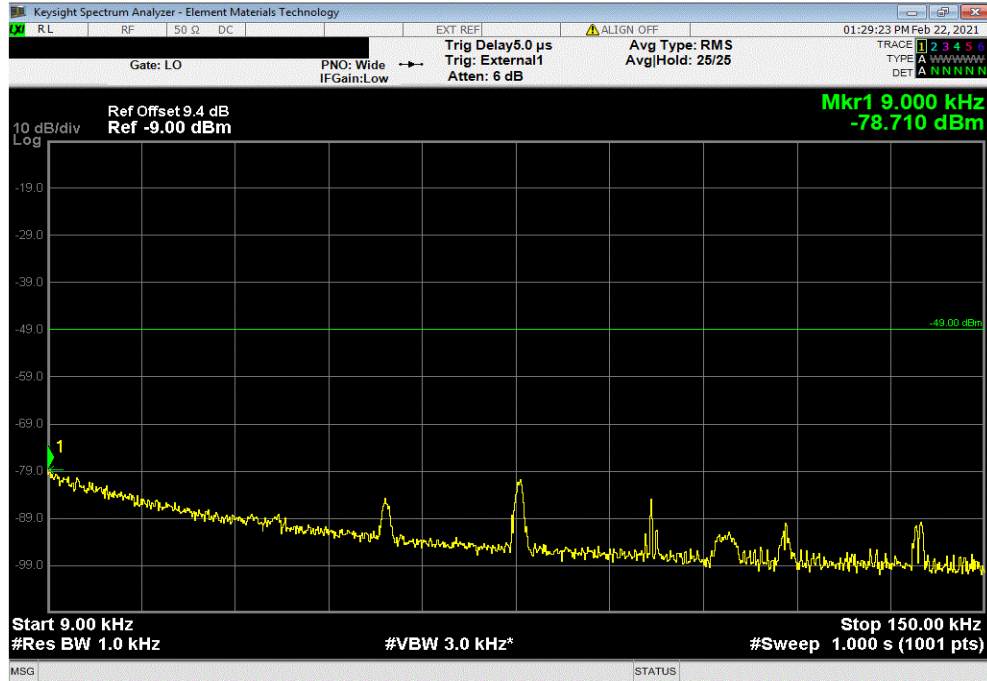


SPURIOUS CONDUCTED EMISSIONS LTE

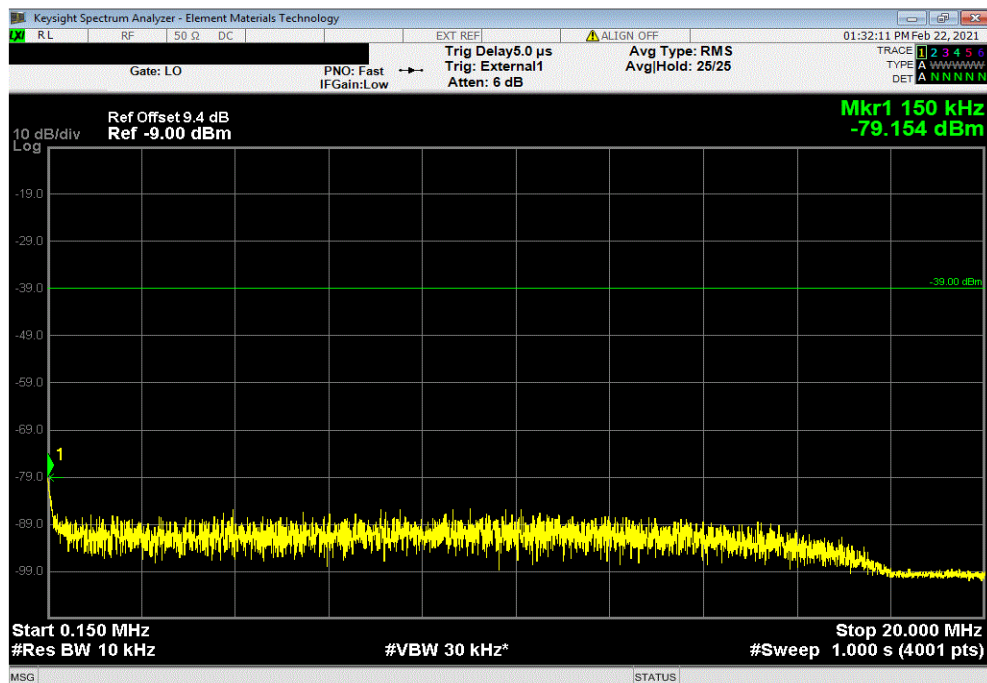


TbTx 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
9 kHz - 150 kHz	0.01	-78.71	-49	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
150 kHz - 20 MHz	0.15	-79.15	-39	Pass	

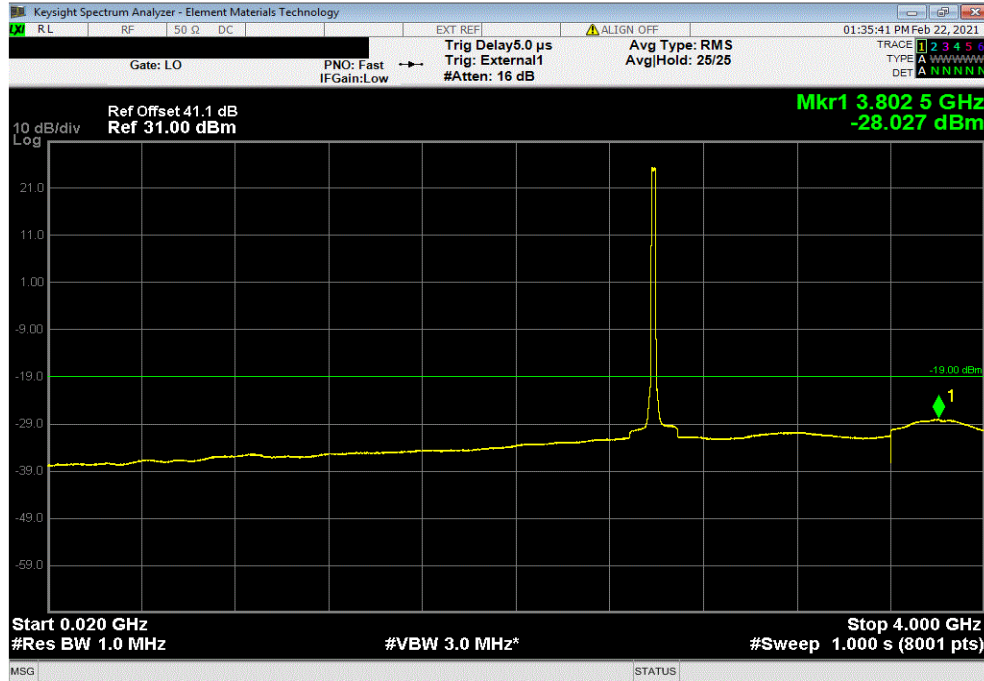


SPURIOUS CONDUCTED EMISSIONS LTE

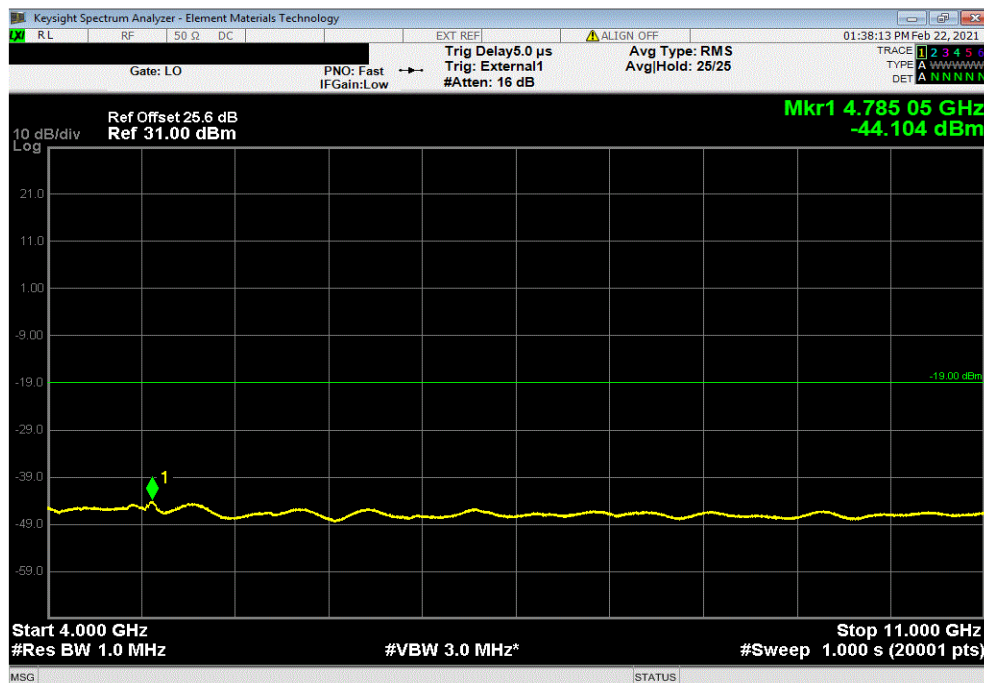


TbTtX 2019.08.30.0 XMt 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
20 MHz - 4 GHz	3802.49	-28.03	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
4 GHz - 11 GHz	4785.05	-44.10	-19	Pass	

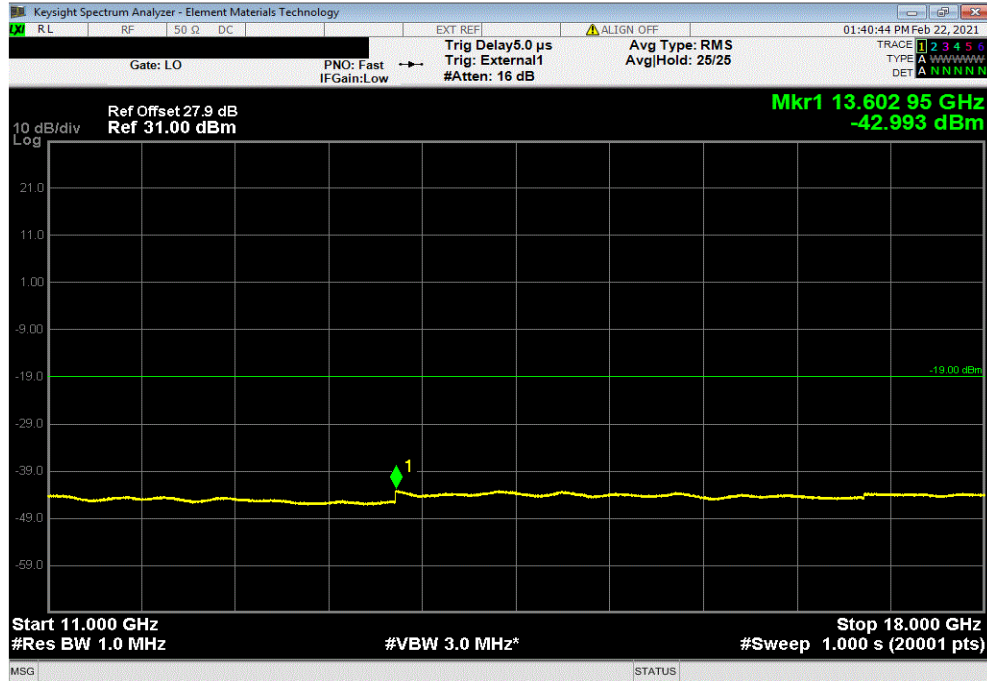


SPURIOUS CONDUCTED EMISSIONS LTE

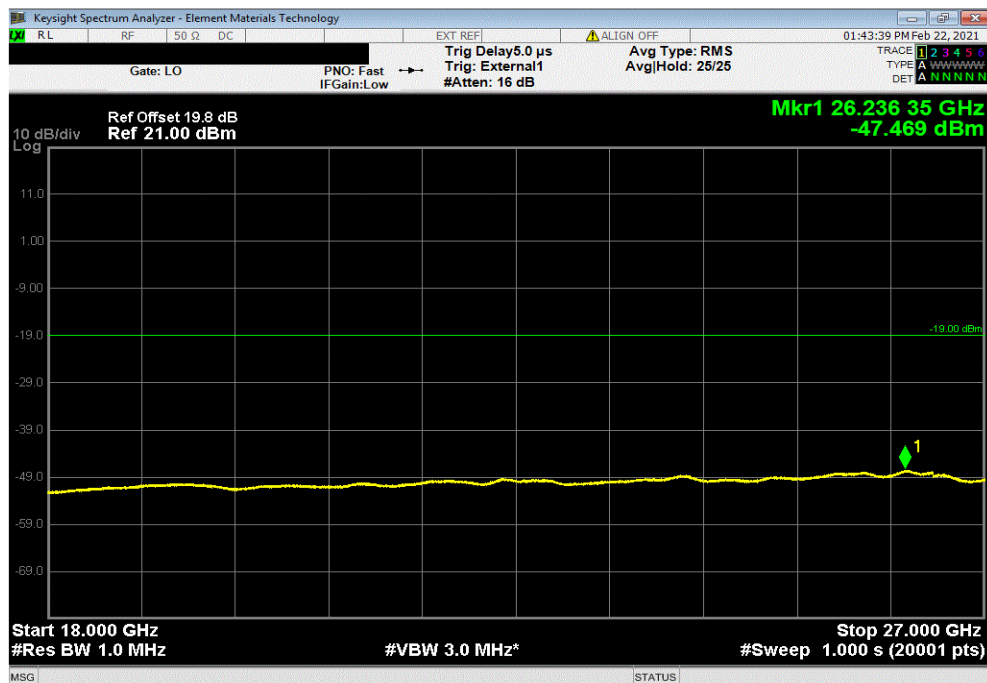


TbTtx 2019.08.30.0 XMI 2020.12.30.0

4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
11 GHz - 18 GHz	13602.95	-42.99	-19	Pass	



4G LTE, Band 41, 2496 MHz - 2690 MHz, Port 1, LTE20 (20MHz), 256QAM, Mid Channel 2593 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit < (dBm)	Result	
18 GHz - 27 GHz	26236.35	-47.47	-19	Pass	



SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2021.01.22.0

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

5G NR100, Mid Ch 2592.99 MHz, Full Power, QPSK, Singlemode SFP

5G NR100, Mid Ch 2592.99 MHz, Full Power, QPSK, Multimode SFP

POWER SETTINGS INVESTIGATED

54 VDC

CONFIGURATIONS INVESTIGATED

NOKI0018 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	40000 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAM	2020-09-18	2021-09-18
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	PAL	2020-09-17	2021-09-17
Cable	Northwest EMC	18-40GHz	TXE	2020-09-18	2021-09-18
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXW	2020-09-02	2022-09-02
Antenna - Double Ridge	ETS Lindgren	3115	AJL	2020-10-20	2022-10-20
Cable	Northwest EMC	8-18GHz	TXD	2020-05-14	2021-05-14
Cable	Northwest EMC	1-8.2 GHz	TXC	2020-06-02	2021-06-02
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	PAK	2020-09-17	2021-09-17
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	2020-06-02	2021-06-02
Filter - High Pass	Micro-Tronics	HPM50108	HGD	2020-09-17	2021-09-17
Filter - High Pass	Micro-Tronics	HPM50111	HGC	2020-03-11	2021-03-11
Antenna - Biconilog	ETS Lindgren	3143B	AYF	2020-06-25	2022-06-25
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	2020-07-01	2021-07-01
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	2020-05-28	2021-05-28
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	2020-05-28	2021-05-28
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	2020-05-07	2021-05-07

TEST DESCRIPTION

The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

SPURIOUS RADIATED EMISSIONS



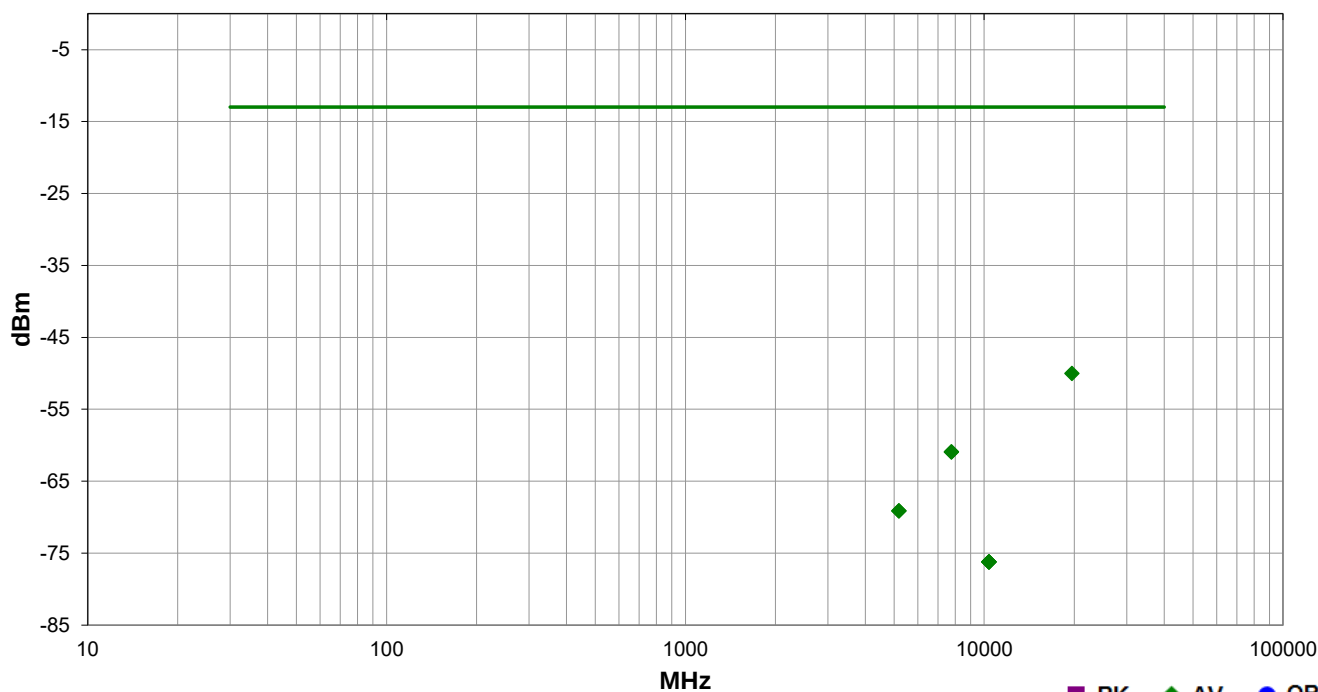
EmiR5 2021.01.08.0

PSA-ESCI 2021.01.22.0

Work Order:	NOKI0018	Date:	2021-02-24		
Project:	None	Temperature:	23.3 °C		
Job Site:	TX02	Humidity:	32.7% RH		
Serial Number:	YK203400016	Barometric Pres.:	1016 mbar		
EUT:		AZHL			Tested by: Mark Baytan and Marty Martin
Configuration:		5			
Customer:	Nokia Solutions and Networks				
Attendees:	John Rattanavong, Mitchell Hill, David Le				
EUT Power:	54 VDC				
Operating Mode:	5G NR100, Mid Ch 2592.99 MHz, Full Power, QPSK, Multimode SFP				
Deviations:	None				
Comments:	The EUT antenna ports are terminated into 50 ohm loads.				

Test Specifications	Test Method
FCC 27.53:2021	ANSI C63.26:2015

Run #	17	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	19660.770	1.3	76.9	Horz	AV	9.9E-9	-50.0	-13.0	-37.0	
	7778.540	1.0	63.9	Horz	AV	807.5E-12	-60.9	-13.0	-47.9	
	7778.523	1.0	31.0	Vert	AV	807.5E-12	-60.9	-13.0	-47.9	
	5185.343	1.0	255.9	Horz	AV	122.2E-12	-69.1	-13.0	-56.1	
	5184.980	1.0	309.9	Vert	AV	122.2E-12	-69.1	-13.0	-56.1	
	10370.690	2.4	63.9	Horz	AV	23.8E-12	-76.2	-13.0	-63.2	
	10371.570	1.0	262.9	Vert	AV	23.8E-12	-76.2	-13.0	-63.2	
	10370.690	2.4	63.9	Horz	AV	23.8E-12	-76.2	-13.0	-63.2	
	10371.570	1.0	262.9	Vert	AV	23.8E-12	-76.2	-13.0	-63.2	

SPURIOUS RADIATED EMISSIONS

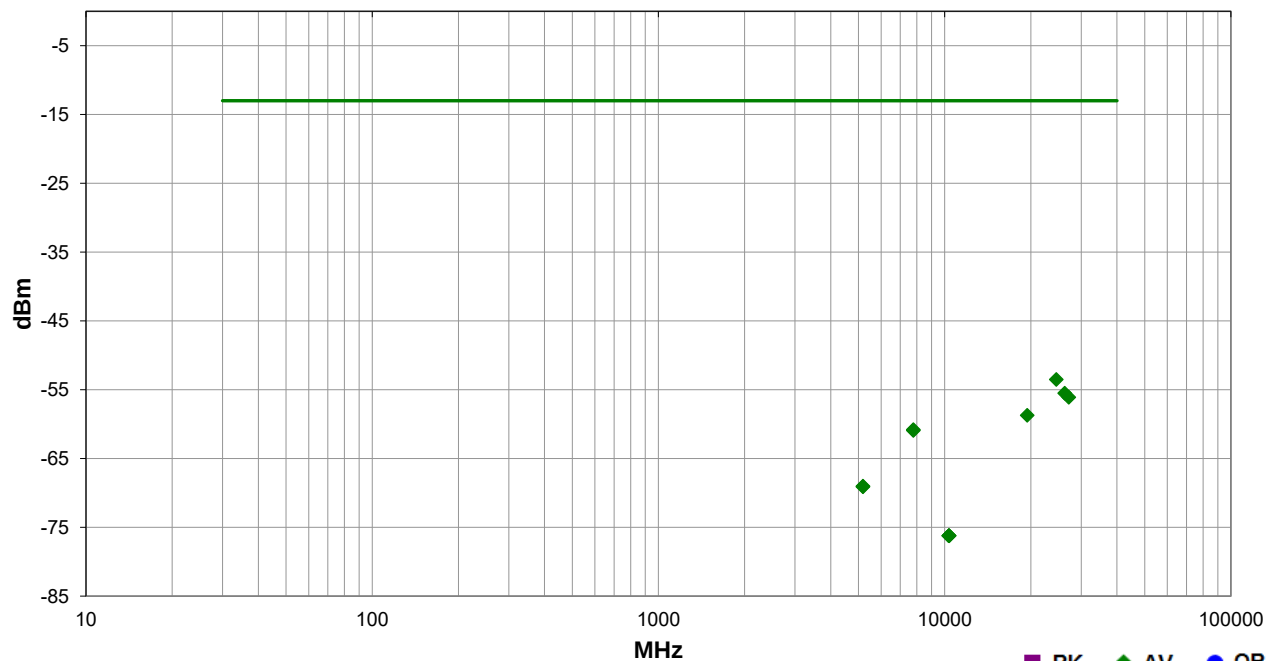


EmiR5 2021.01.08.0

PSA-ESCI 2021.01.22.0

Work Order:	NOKI0018	Date:	2021-02-24		
Project:	None	Temperature:	23.3 °C		
Job Site:	TX02	Humidity:	32.7% RH		
Serial Number:	YK203400016	Barometric Pres.:	1016 mbar		
				Tested by:	Mark Baytan and Marty Martin
EUT:	AZHL				
Configuration:	5				
Customer:	Nokia Solutions and Networks				
Attendees:	John Rattanavong, Mitchell Hill, David Le				
EUT Power:	54 VDC				
Operating Mode:	5G NR100, Mid Ch 2592.99 MHz, Full Power, QPSK, Singlemode SFP				
Deviations:	None				
Comments:	The EUT antenna ports are terminated into 50 ohm loads.				

Test Specifications				Test Method			
FCC 27.53:2021				ANSI C63.26:2015			
Run #	15	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
24554.930	1.3	46.9	Vert	AV	4.4E-9	-53.5	-13.0	-40.5	
26275.620	1.3	32.0	Vert	AV	2.8E-9	-55.5	-13.0	-42.5	
27155.530	1.3	20.0	Horz	AV	2.4E-9	-56.1	-13.0	-43.1	
19430.100	1.3	50.0	Vert	AV	1.3E-9	-58.7	-13.0	-45.7	
7778.530	1.5	120.0	Horz	AV	826.3E-12	-60.8	-13.0	-47.8	
7777.627	2.6	259.0	Vert	AV	807.5E-12	-60.9	-13.0	-47.9	
5184.657	3.4	330.0	Vert	AV	125.1E-12	-69.0	-13.0	-56.0	
5185.443	1.5	99.0	Horz	AV	122.2E-12	-69.1	-13.0	-56.1	
10370.430	3.3	321.9	Vert	AV	23.8E-12	-76.2	-13.0	-63.2	
10370.350	1.5	189.9	Horz	AV	23.8E-12	-76.2	-13.0	-63.2	
10370.350	1.5	189.9	Horz	AV	23.8E-12	-76.2	-13.0	-63.2	
10370.430	3.3	321.9	Vert	AV	23.8E-12	-76.2	-13.0	-63.2	