

XMit 2020.12.30.0

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	ANC	2021-06-24	2022-06-24
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2021-03-11	2022-03-11
Block - DC	Fairview Microwave	SD3379	AMM	2020-09-21	2021-09-21
Generator - Signal	Agilent	N5173B	TIW	2020-07-17	2023-07-17

TEST DESCRIPTION

The antenna port spurious emissions were measured at the RF output terminal of the EUT through 3 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 20 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), 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 -25 dBm [-13 dBm -10 log (16)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 16 port MIMO transmitter. RF conducted emissions testing was performed on one port. The AAFB antenna ports are essentially electrically identical (the RF power variation between antenna ports is small as shown in this certification report) and port 1 was selected to perform the testing under this effort as allowed by ANSI C63.26-2015 paragraphs 5.2.5.3, 5.7.2i and 6.4.

The limit for the 9kHz to 150kHz frequency range was adjusted to –55dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 1MHz [i.e.: -55dBm = -25dBm -10log(1MHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to –45dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 1MHz [i.e.: -45dBm = -25dBm -10log(1MHz/10kHz)]. The required limit of -25dBm with a RBW of > 1MHz was used for all other frequency ranges.

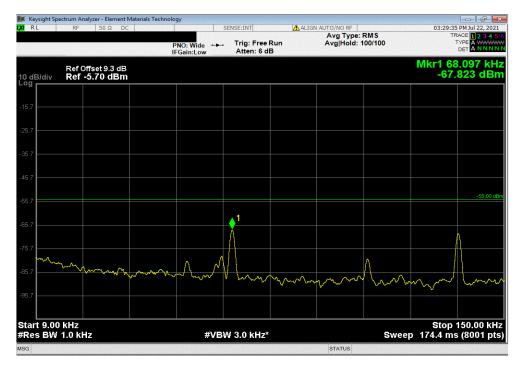
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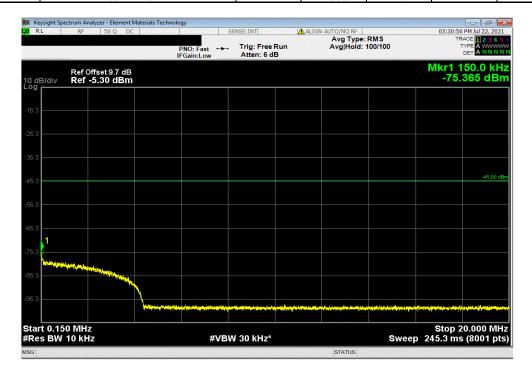
					TbtTx 2021.03.19.1	XMit 202
	AFB (FCC/ISED C2PC)			Work Order:		
Serial Number: B					26-Jul-21	
Customer: N	lokia Solutions and Networ	ks		Temperature:		
	avid Le, Mitchell Hill			Humidity:		
Project: N	lone			Barometric Pres.:	1017 mbar	
Tested by: B	randon Hobbs		Power: 54 VDC	Job Site:	TX09	
ST SPECIFICATION	NS		Test Method			
C 24E:2021			ANSI C63.26:2015			
S-133 Issue 6:2013	3+A1:2018		RSS-133 Issue 6:2013+A1:2018			
MMENTS						
measurement path	h losses were accounted for	or in the reference level offest including a	ny attenuators, filters and DC blocks.Band n25 carriers a	re enabled at maximum power (6.25 w	vatts/carrier).	
WATIONS FROM T	TEGT OTANDARD					
VIATIONS FROM T	IESI STANDARD					
ne	1					
nfiguration #	1,2,3	7	-/1 /			
inigaration #	1,2,0	Signature				
		Gigitatar 6	Frequency			
			Range	Value (dBm)	Limit (dBm)	Result
nd n25, 1930 MHz -						
P	ort 1					
	5 MHz Bandwdit					
	QF	SK Modulation				
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-67.8	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-75.4	-45	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.2	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-35.3	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-40.3	-25	Pass
		Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.5	-25	Pass
	16-	-QAM Modulation	Old - Approx	22.2		
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-68.8	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-75.5	-45	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.5	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-35.4	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-40.7	-25	Pass
	_	Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.4	-25	Pass
	64-	-QAM Modulation				
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-68.0	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-76.1	-45	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.9	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-35.1	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-40.2	-25	Pass
	_	Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.3	-25	Pass
	25	6-QAM Modulation				
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-68.4	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-76.3	-45	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.4	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-35.5	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-40.4	-25	Pass
		Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.4	-25	Pass
	10 MHz Bandwd					
	25	6-QAM Modulation	A.I.I. 45			_
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-67.8	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-77.3	-45	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.2	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-35.1	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-41.1	-25	Pass
	45.441.5	Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.4	-25	Pass
	15 MHz Bandwd					
	25	6-QAM Modulation	0 14 1- 450 14 1-	60.0	<i>EE</i>	Darr
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-68.3 -77.7	-55	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-77.7	-45 25	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.3 25.2	-25 -25	Pass
		Mid Channel, 1962.5 MHz Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz 3 GHz - 12 GHz	-35.2 -41.3	-25 -25	Pass Pass
		Mid Channel, 1962.5 MHz Mid Channel, 1962.5 MHz	3 GHz - 12 GHz 12 GHz - 20 GHz	-41.3 -40.4	-25 -25	Pass
	20 MHz Bandwd		12 GHZ - 20 GHZ	-40.4	-25	Pass
	250	6-QAM Modulation	0 14 1- 450 14 1-	60.4	F.F.	Derr
		Mid Channel, 1962.5 MHz	9 kHz - 150 kHz	-69.4 77.5	-55 45	Pass
		Mid Channel, 1962.5 MHz	150 kHz - 20 MHz	-77.5 21.5	-45 25	Pass
		Mid Channel, 1962.5 MHz	20 MHz - 3 GHz	-31.5	-25	Pass
		Mid Channel, 1962.5 MHz	1910 MHz - 2010 MHz	-34.9	-25	Pass
		Mid Channel, 1962.5 MHz	3 GHz - 12 GHz	-41.2	-25	Pass
		Mid Channel, 1962.5 MHz	12 GHz - 20 GHz	-40.5	-25	Pass

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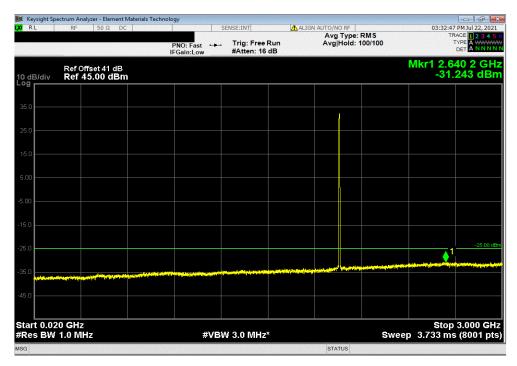
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 9	5 MHz Bandwdith	, QPSK Modulation	on , Mid Channel,	, 1962.5 MHz
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
150 kHz - 20 MHz		-75.36	-45	Pass



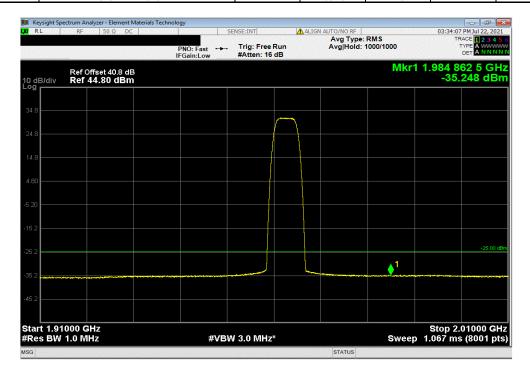
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, QPSK Modulation , Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz -31.24 -25 Pass



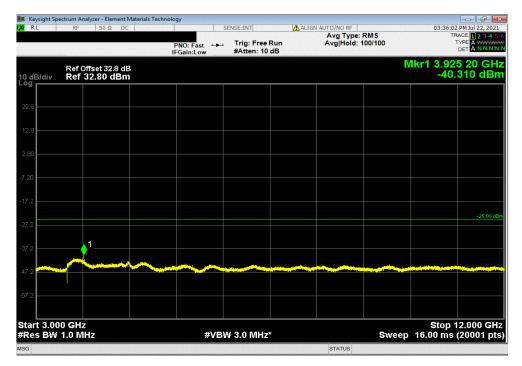
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5	MHz Bandwdith,	QPSK Modulation	on , Mid Channel,	1962.5 MHz
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
1910 MHz - 2010 MHz		-35.25	-25	Pass



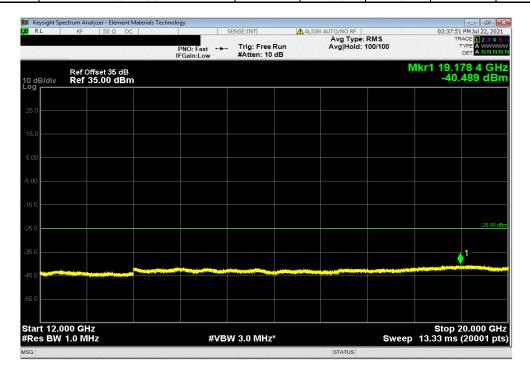
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, QPSK Modulation , Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
3 GHz - 12 GHz - 40.31 -25 Pass



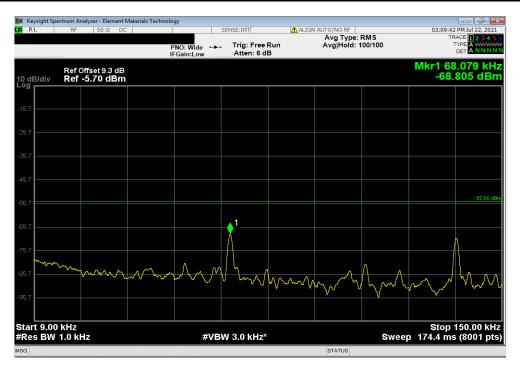
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 9	5 MHz Bandwdith	, QPSK Modulation	on , Mid Channel,	, 1962.5 MHz
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
12 GHz - 20 GHz		-40.49	-25	Pass



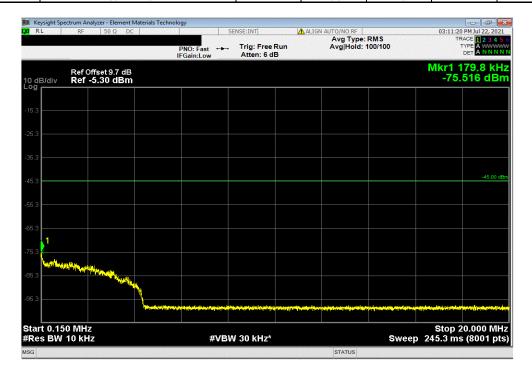
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
9 kHz - 150 kHz
-68.81 -55 Pass



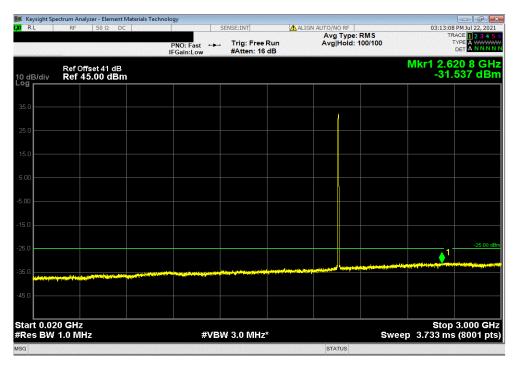
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz						
Frequency						
Range		Value (dBm)	Limit (dBm)	Result		
150 kHz - 20 MHz		-75.52	-45	Pass		



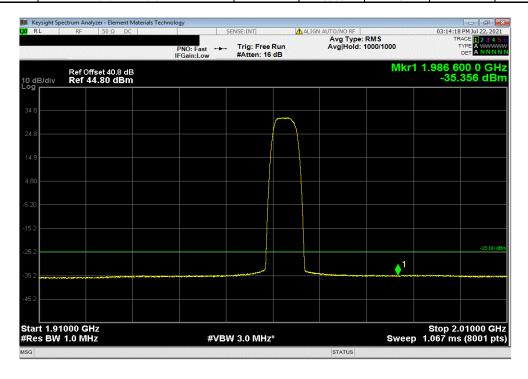
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz -31.54 -25 Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz					
Frequency					
Range		Value (dBm)	Limit (dBm)	Result	
1910 MHz - 2010 MHz		-35.36	-25	Pass	



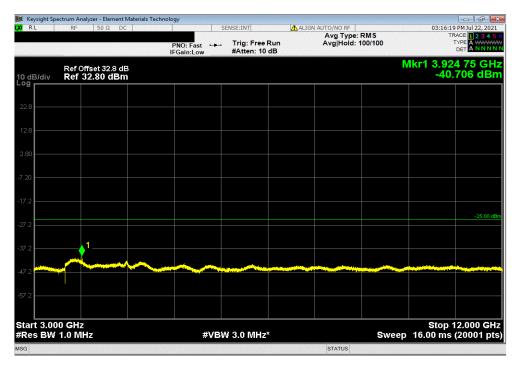
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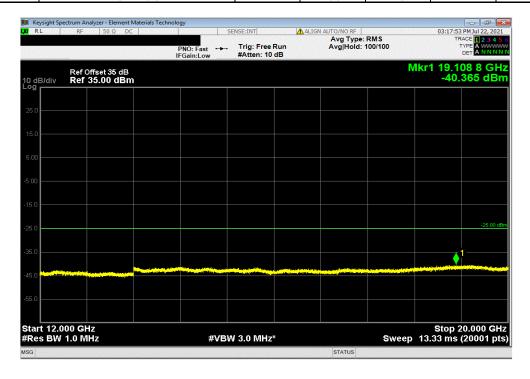
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range Value (dBm) Limit (dBm) Result

3 GHz - 12 GHz -40.71 -25 Pass



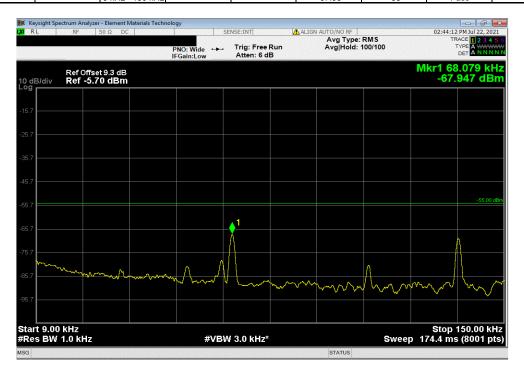
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 16-QAM Modulation, Mid Channel, 1962.5 MHz					
Frequency					
Range		Value (dBm)	Limit (dBm)	Result	
12 GHz - 20 GHz		-40.37	-25	Pass	



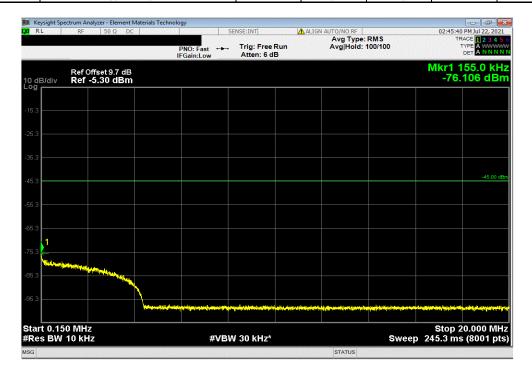
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
9 kHz - 150 kHz
9 kHz - 150 kHz
7 kHz - 150 kHz
7 kHz - 150 kHz



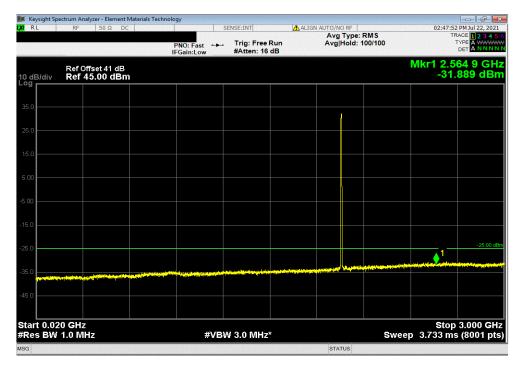
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz					
Frequency					
Range		Value (dBm)	Limit (dBm)	Result	
150 kHz - 20 MHz		-76.11	-45	Pass	



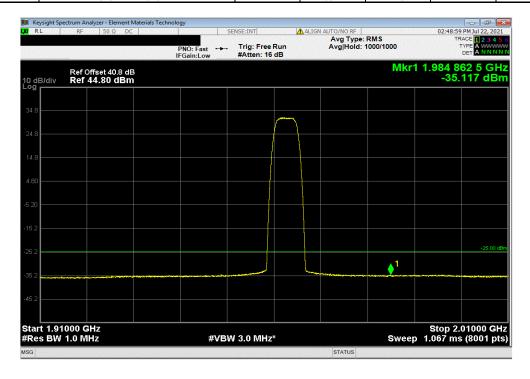
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz
-31.89
-25
Pass



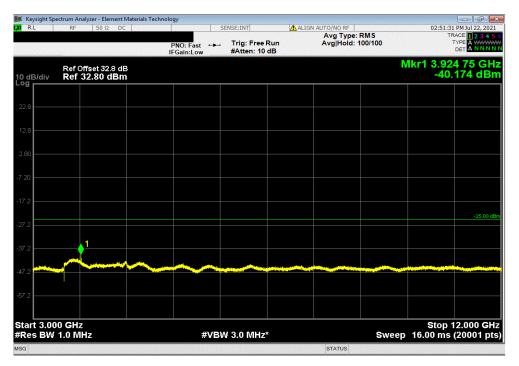
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz					
Frequency					
Range		Value (dBm)	Limit (dBm)	Result	
1910 MHz - 2010 MHz		-35.12	-25	Pass	



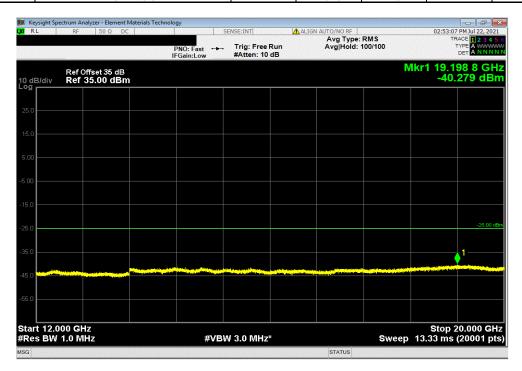
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
3 GHz - 12 GHz
-40.17 -25 Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 64-QAM Modulation, Mid Channel, 1962.5 MHz					
Frequency					
Range		Value (dBm)	Limit (dBm)	Result	
12 GHz - 20 GHz		-40.28	-25	Pass	



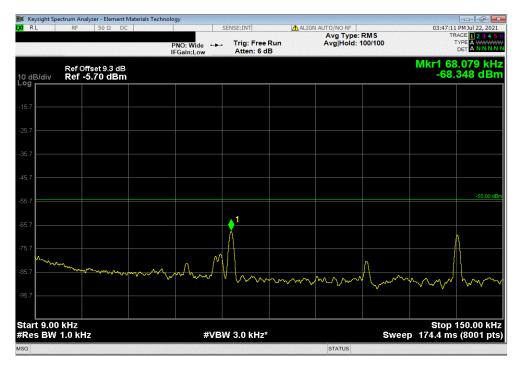
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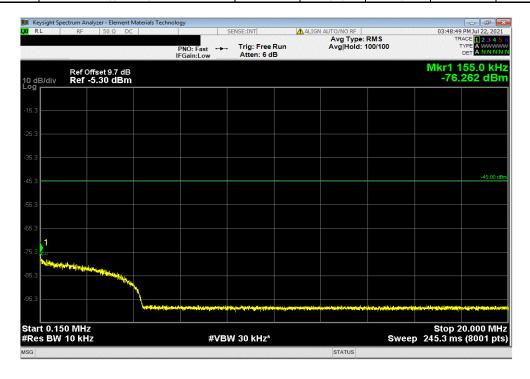
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range
Value (dBm) Limit (dBm) Result

9 kHz - 150 kHz
-68.35 -55 Pass



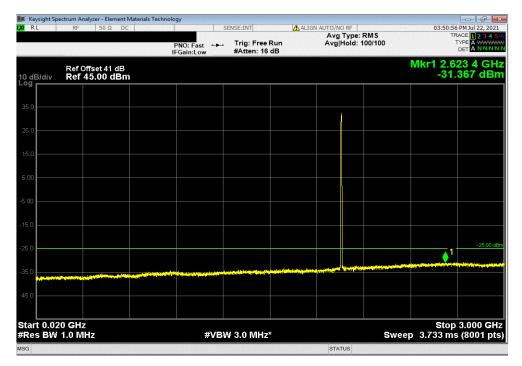
Band	Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz						
	Frequency						
	Range		Value (dBm)	Limit (dBm)	Result		
	150 kHz - 20 MHz		-76.26	-45	Pass		



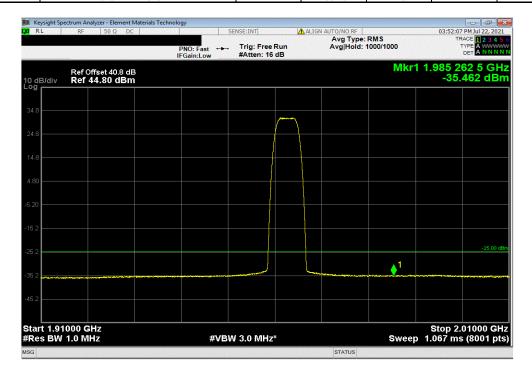
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz - 31.37 -25 Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
1910 MHz - 2010 MHz		-35.46	-25	Pass



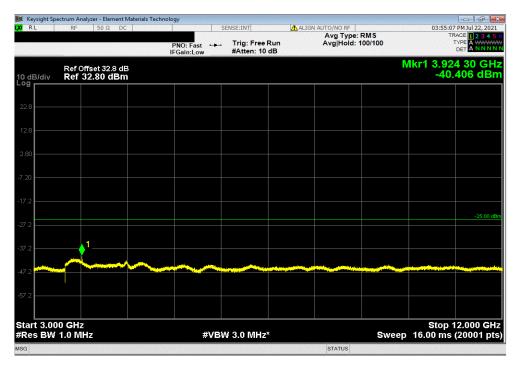
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range Value (dBm) Limit (dBm) Result

3 GHz - 12 GHz -40.41 -25 Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 5 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
12 GHz - 20 GHz		-40.43	-25	Pass



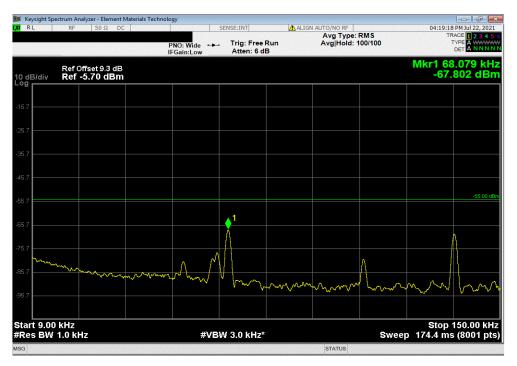
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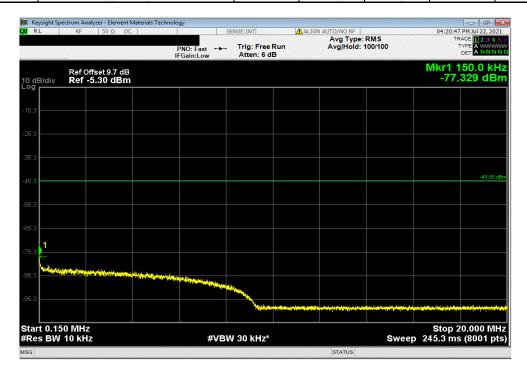
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range Value (dBm) Limit (dBm) Result

9 kHz - 150 kHz - 67.8 -55 Pass



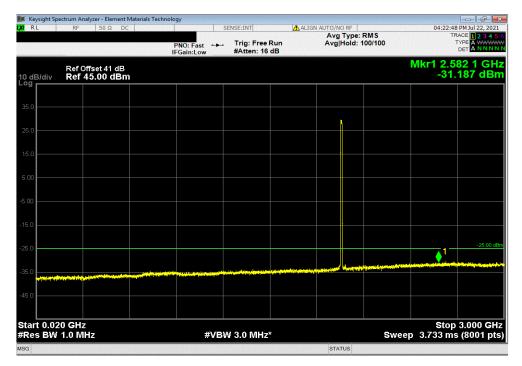
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
150 kHz - 20 MHz		-77.33	-45	Pass



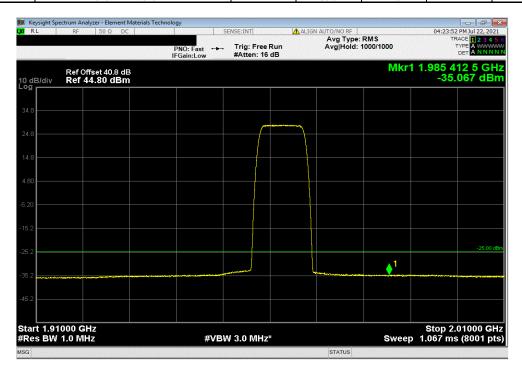
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz -31.19 -25 Pass



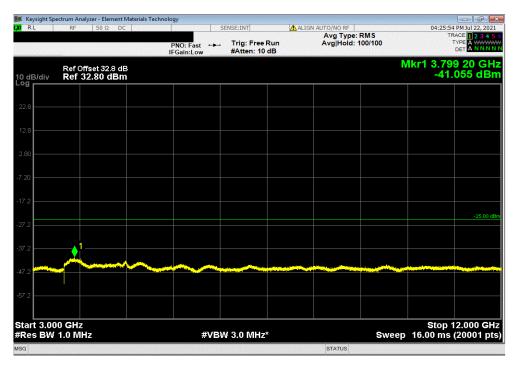
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
1910 MHz - 2010 MHz		-35.07	-25	Pass



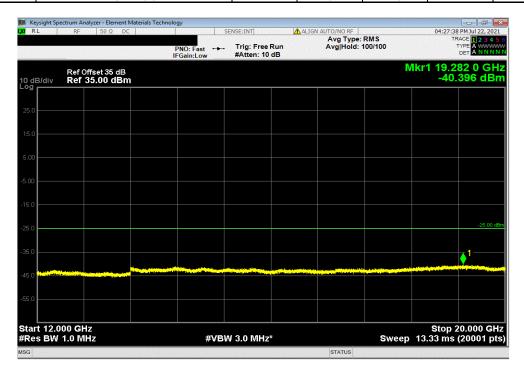
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
3 GHz - 12 GHz -41.06 -25 Pass



	Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 10 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
	Frequency				
_	Range		Value (dBm)	Limit (dBm)	Result
ſ	12 GHz - 20 GHz		-40.4	-25	Pass

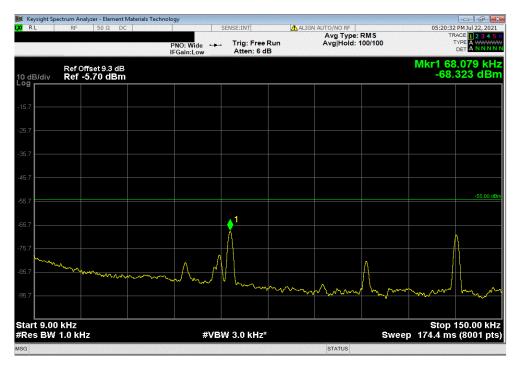


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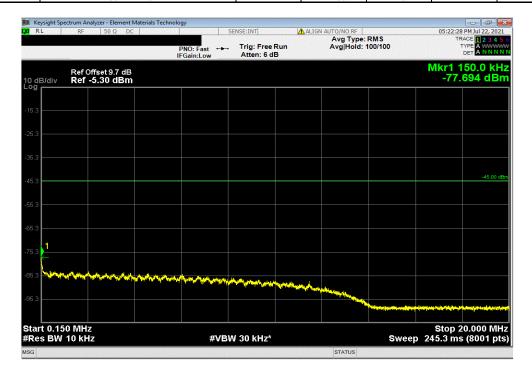


Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range
Value (dBm)
Limit (dBm)
Result
9 kHz - 150 kHz
-68.32
-55
Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
150 kHz - 20 MHz		-77.69	-45	Pass



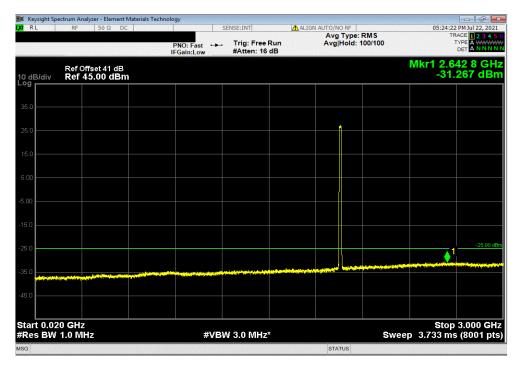
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range Value (dBm) Limit (dBm) Result

20 MHz - 3 GHz -31.27 -25 Pass



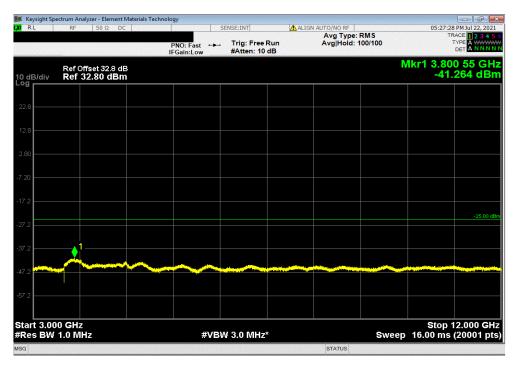
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
1910 MHz - 2010 MHz		-35.15	-25	Pass



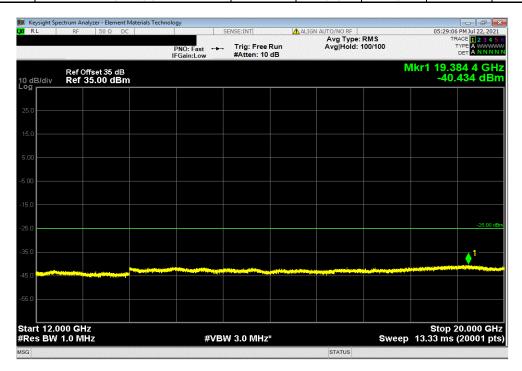
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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
3 GHz - 12 GHz
-41.26 -25 Pass



	Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 15 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
	Frequency				
	Range		Value (dBm)	Limit (dBm)	Result
İ	12 GHz - 20 GHz		-40.43	-25	Pass



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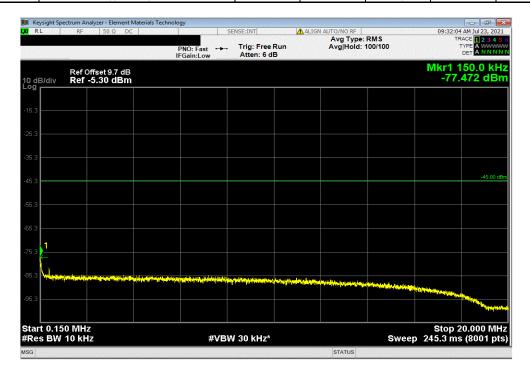
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz

Frequency
Range Value (dBm) Limit (dBm) Result

9 kHz - 150 kHz - 55 Pass



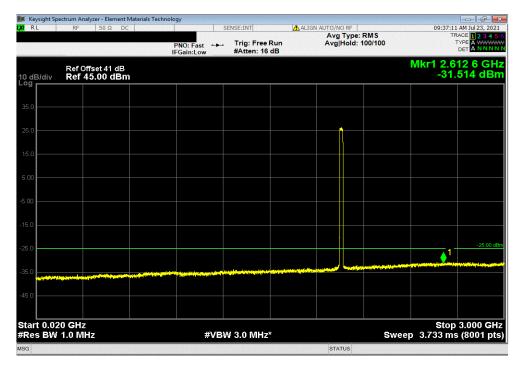
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range	Value	(dBm)	Limit (dBm)	Result
150 kHz - 20 MHz	-7	7.47	-45	Pass



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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range Value (dBm) Limit (dBm) Result
20 MHz - 3 GHz -31.51 -25 Pass



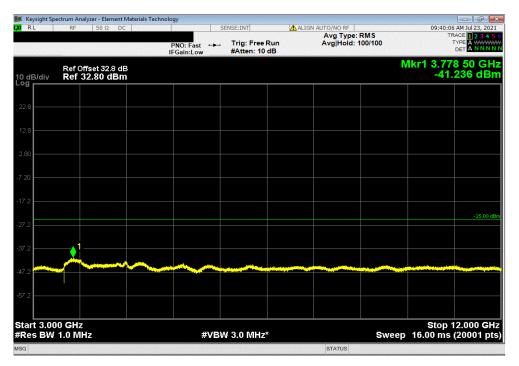
Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range	Value (d	Bm) Limit (dBm)	Result	
1910 MHz - 2010 MHz	-34.9	-25	Pass	



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Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz
Frequency
Range
Value (dBm) Limit (dBm) Result
3 GHz - 12 GHz
-41.24 -25 Pass



Band n25, 1930 MHz - 1995 MHz, 5G, Port 1, 20 MHz Bandwdith, 256-QAM Modulation, Mid Channel, 1962.5 MHz				
Frequency				
Range		Value (dBm)	Limit (dBm)	Result
12 GHz - 20 GHz		-40.5	-25	Pass



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End of Test Report

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