SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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 approach 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 AHFIHA 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 24.238(a), RSS 133 6.5 (i), FCC 27.53(h)(1), RSS-139 5.6, FCC 27.53(m)(2), and RSS-199 5.6, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

The resolution bandwidth to be used for these measurements is per FCC 24.238(b), RSS 133 6.5 (i), FCC 27.53(h)(3), RSS-139 5.6, FCC 27.53(m)(6), and RSS-199 5.6. Compliance is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

The testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small, and there was small variation in measurements over modulation types from previous certification testing efforts. The highest rate modulation type (256QAM) was used. (See ANSI C63.26. clause 5.7.2e).

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 > 1MHz was used for all other frequency ranges.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2023-03-17	2024-03-17
Block - DC	Fairview Microwave	SD3379	AMM	2023-08-04	2024-08-04
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14

SPURIOUS CONDUCTED EMISSIONS

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EUT:	AirScale Base Transceiver Station Remote Radio Head Model AHFIHA	Work Order:	NOKI0072
Serial Number:	RW233403213	Date:	2023-12-14
Customer:	Nokia Solutions and Networks	Temperature:	21.1°C
Attendees:	John Rattanavong, Mitch Hill	Relative Humidity:	33.8%
Customer Project:	None	Bar. Pressure (PMSL):	1028 mbar
Tested By:	Jarrod Brenden	Job Site:	TX07
Power:	54VDC	Configuration:	NOKI0072-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 24E:2024	ANSI C63.26:2015
FCC 27:2024	ANSI C63.26:2015
RSS-133 Issue 6:2013 +A1:2018	ANSI C63.26:2015
RSS-199 Issue 4:2023	ANSI C63.26:2015
RSS139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

Losses in the measurement path were accounted for: DC Block, attenuators, cables, and filters where used. PCS Band n25, AWS Band n66, and BRS Band n7 carriers are enabled individually at maximum power (40 watts/carrier for 5MHz carrier and 60W/carrier for 10MHz to 40MHz carriers).

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
Port 1					
PCS Band n25, 1930 MHz - 1995 MHz					
5 MHz Bandwidth					
256QAM Modulation					
Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.009	-67.943	-49	Pass
	150 kHz - 20 MHz	0.153	-58.964	-39	Pass
	20 MHz - 3.5 GHz	2200.2	-20.68	-19	Pass
	1.9 GHz - 2.7 GHz	2200.3	-22.178	-19	Pass
	3.5 GHz - 13 GHz	3743.68	-35.199	-19	Pass
	13 GHz - 27 GHz	26243.5	-25.923	-19	Pass
10 MHz Bandwidth					
256QAM Modulation					
Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.009	-68.603	-49	Pass
	150 kHz - 20 MHz	0.157	-59.295	-39	Pass
	20 MHz - 3.5 GHz	2200.2	-20.607	-19	Pass
	1.9 GHz - 2.7 GHz	2200.3	-20.544	-19	Pass
	3.5 GHz - 13 GHz	3791.65	-35.163	-19	Pass

SPURIOUS CONDUCTED EMISSIONS

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		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
		13 GHz - 27 GHz	26266.4	-25.988	-19	Pass
15 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.009	-68.334	-49	Pass
		150 kHz - 20 MHz	0.150	-58.642	-39	Pass
		20 MHz - 3.5 GHz	2200.2	-19.753	-19	Pass
		1.9 GHz - 2.7 GHz	2200.4	-20.11	-19	Pass
		3.5 GHz - 13 GHz	3808.75	-35.345	-19	Pass
		13 GHz - 27 GHz	26204.3	-26.036	-19	Pass
20 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.010	-68.571	-49	Pass
		150 kHz - 20 MHz	0.150	-58.485	-39	Pass
		20 MHz - 3.5 GHz	2200.2	-20.121	-19	Pass
		1.9 GHz - 2.7 GHz	2200.4	-20.303	-19	Pass
		3.5 GHz - 13 GHz	3766	-35.436	-19	Pass
		13 GHz - 27 GHz	26278.5	-26.158	-19	Pass
25 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.009	-67.967	-49	Pass
		150 kHz - 20 MHz	0.155	-58.399	-39	Pass
		20 MHz - 3.5 GHz	2200.2	-20.322	-19	Pass
		1.9 GHz - 2.7 GHz	2200.2	-20.547	-19	Pass
		3.5 GHz - 13 GHz	3808.75	-35.366	-19	Pass
		13 GHz - 27 GHz	26298.1	-25.971	-19	Pass
30 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.010	-68.471	-49	Pass
		150 kHz - 20 MHz	0.150	-58.942	-39	Pass
		20 MHz - 3.5 GHz	2200.2	-19.992	-19	Pass
		1.9 GHz - 2.7 GHz	2200.2	-19.993	-19	Pass
		3.5 GHz - 13 GHz	3844.38	-35.456	-19	Pass
		13 GHz - 27 GHz	26219.7	-26.144	-19	Pass
40 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 1962.5 MHz	9 kHz - 150 kHz	0.009	-68.205	-49	Pass
		150 kHz - 20 MHz	0.150	-58.316	-39	Pass
		20 MHz - 3.5 GHz	2200.2	-20.144	-19	Pass
		1.9 GHz - 2.7 GHz	2200.2	-20.646	-19	Pass
		3.5 GHz - 13 GHz	3783.1	-35.219	-19	Pass
		13 GHz - 27 GHz	26234.2	-26.22	-19	Pass
AWS Band n66, 2110 MHz -2200 MHz						
5 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-68.267	-49	Pass
		150 kHz - 20 MHz	0.150	-59.188	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-22.342	-19	Pass
		1.9 GHz - 2.7 GHz	1927.5	-23.817	-19	Pass
		3.5 GHz - 13 GHz	3782.15	-35.148	-19	Pass
		13 GHz - 27 GHz	26259.4	-25.869	-19	Pass
10 MHz Bandwidth						

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element
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		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-67.811	-49	Pass
		150 kHz - 20 MHz	0.150	-58.121	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-20.559	-19	Pass
		1.9 GHz - 2.7 GHz	1927.7	-21.603	-19	Pass
		3.5 GHz - 13 GHz	3775.98	-35.095	-19	Pass
		13 GHz - 27 GHz	26293	-25.975	-19	Pass
15 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.010	-68.591	-49	Pass
		150 kHz - 20 MHz	0.150	-58.883	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-21.105	-19	Pass
		1.9 GHz - 2.7 GHz	1927.8	-21.105	-19	Pass
		3.5 GHz - 13 GHz	3808.75	-36.063	-19	Pass
		13 GHz - 27 GHz	26278.1	-26.340	-19	Pass
20 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-68.203	-49	Pass
		150 kHz - 20 MHz	0.150	-58.309	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-20.744	-19	Pass
		1.9 GHz - 2.7 GHz	1927.8	-20.62	-19	Pass
		3.5 GHz - 13 GHz	3746.05	-35.309	-19	Pass
		13 GHz - 27 GHz	26255.7	-26.305	-19	Pass
25 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-68.819	-49	Pass
		150 kHz - 20 MHz	0.153	-58.803	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-20.442	-19	Pass
		1.9 GHz - 2.7 GHz	1927.8	-21.001	-19	Pass
		3.5 GHz - 13 GHz	3841.05	-35.33	-19	Pass
		13 GHz - 27 GHz	26244.5	-26.211	-19	Pass
30 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-68.792	-49	Pass
		150 kHz - 20 MHz	0.150	-59.261	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-20.242	-19	Pass
		1.9 GHz - 2.7 GHz	1927.8	-21.188	-19	Pass
		3.5 GHz - 13 GHz	3802.1	-35.379	-19	Pass
		13 GHz - 27 GHz	26302.8	-26.226	-19	Pass
40 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2155.0 MHz	9 kHz - 150 kHz	0.009	-68.336	-49	Pass
		150 kHz - 20 MHz	0.150	-58.467	-39	Pass
		20 MHz - 3.5 GHz	1927.9	-20.835	-19	Pass
		1.9 GHz - 2.7 GHz	1927.8	-21.208	-19	Pass
		3.5 GHz - 13 GHz	3812.55	-35.267	-19	Pass
		13 GHz - 27 GHz	26227.7	-26.285	-19	Pass
BRS Band n7, 2620 MHz - 2690 MHz						
5 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-68.254	-49	Pass

SPURIOUS CONDUCTED EMISSIONS

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		Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
		150 kHz - 20 MHz	0.150	-58.596	-39	Pass
		20 MHz - 3.5 GHz	3167.7	-24.589	-19	Pass
		1.9 GHz - 2.7 GHz	2690.9	-25.534	-19	Pass
		3.5 GHz - 13 GHz	3793.08	-35.046	-19	Pass
		13 GHz - 27 GHz	26227.7	-26.1	-19	Pass
10 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-68.155	-49	Pass
		150 kHz - 20 MHz	0.150	-58.892	-39	Pass
		20 MHz - 3.5 GHz	3164.6	-24.73	-19	Pass
		1.9 GHz - 2.7 GHz	2690.5	-25.039	-19	Pass
		3.5 GHz - 13 GHz	3874.3	-35.163	-19	Pass
		13 GHz - 27 GHz	26265.9	-25.966	-19	Pass
15 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-67.985	-49	Pass
		150 kHz - 20 MHz	0.150	-58.968	-39	Pass
		20 MHz - 3.5 GHz	3192	-24.822	-19	Pass
		1.9 GHz - 2.7 GHz	2690.5	-24.706	-19	Pass
		3.5 GHz - 13 GHz	3852.93	-35.225	-19	Pass
		13 GHz - 27 GHz	26283.7	-25.975	-19	Pass
20 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-68.815	-49	Pass
		150 kHz - 20 MHz	0.150	-58.581	-39	Pass
		20 MHz - 3.5 GHz	3207.7	-24.948	-19	Pass
		1.9 GHz - 2.7 GHz	2690.9	-24.159	-19	Pass
		3.5 GHz - 13 GHz	3803.53	-35.381	-19	Pass
		13 GHz - 27 GHz	26267.3	-26.061	-19	Pass
25 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-67.663	-49	Pass
		150 kHz - 20 MHz	0.150	-58.415	-39	Pass
		20 MHz - 3.5 GHz	3202.9	-24.612	-19	Pass
		1.9 GHz - 2.7 GHz	2691	-24.67	-19	Pass
		3.5 GHz - 13 GHz	3799.25	-35.279	-19	Pass
		13 GHz - 27 GHz	26266.9	-26.15	-19	Pass
30 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-68.394	-49	Pass
		150 kHz - 20 MHz	0.150	-58.598	-39	Pass
		20 MHz - 3.5 GHz	3211.6	-24.876	-19	Pass
		1.9 GHz - 2.7 GHz	2691.1	-23.171	-19	Pass
		3.5 GHz - 13 GHz	3775.98	-35.266	-19	Pass
		13 GHz - 27 GHz	26221.1	-26.149	-19	Pass
40 MHz Bandwidth						
256QAM Modulation						
	Mid Ch, 2655.0 MHz	9 kHz - 150 kHz	0.009	-68.827	-49	Pass
		150 kHz - 20 MHz	0.153	-58.419	-39	Pass
		20 MHz - 3.5 GHz	3188.1	-24.404	-19	Pass
		1.9 GHz - 2.7 GHz	2692.6	-23.117	-19	Pass

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	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
	3.5 GHz - 13 GHz	3784.05	-35.263	-19	Pass
	13 GHz - 27 GHz	26227.7	-26.285	-19	Pass

SPURIOUS CONDUCTED EMISSIONS

element
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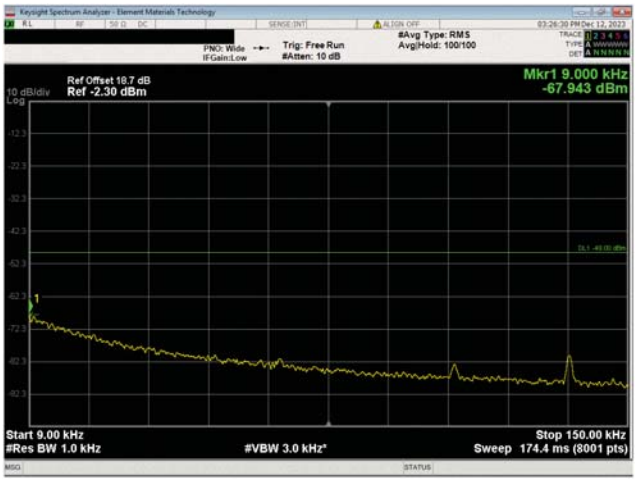
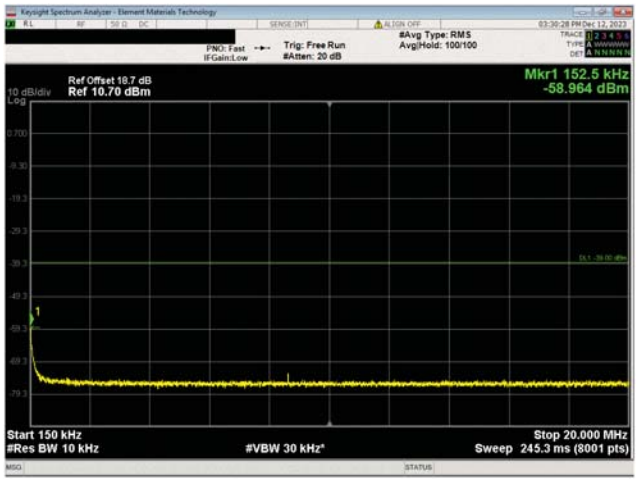
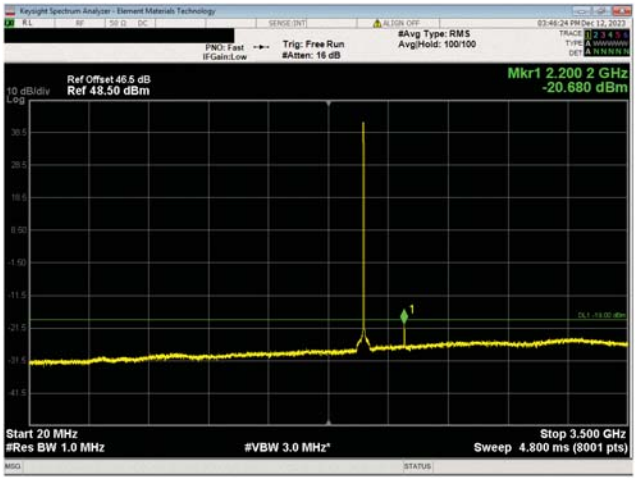


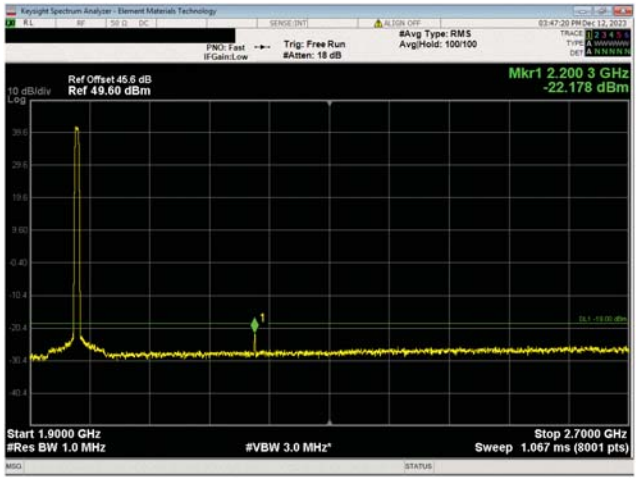
PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

element
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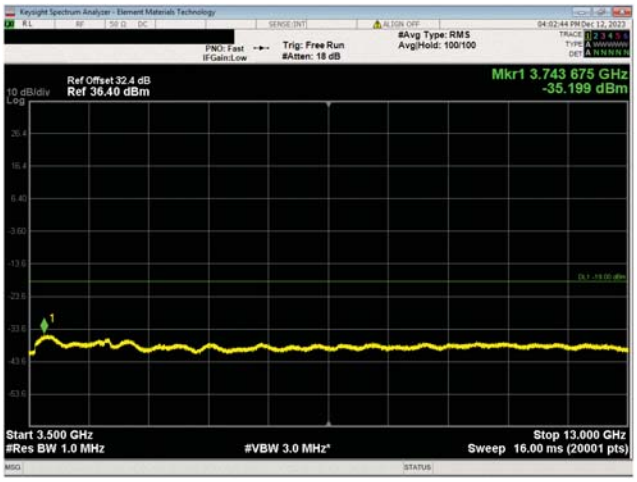
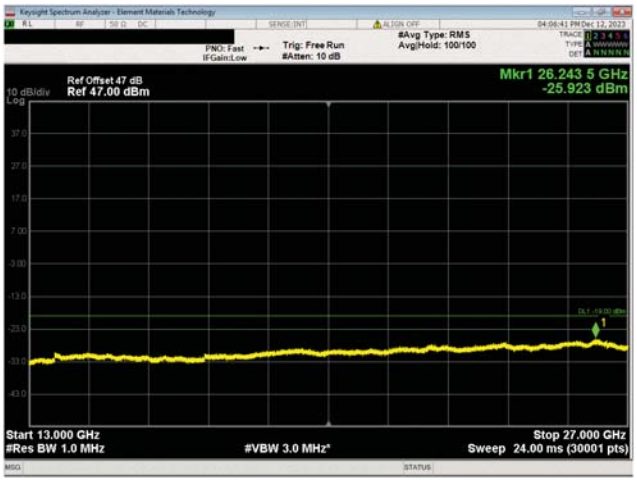
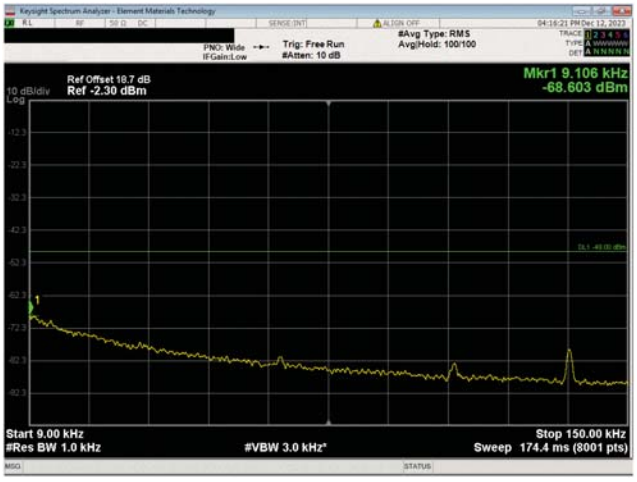


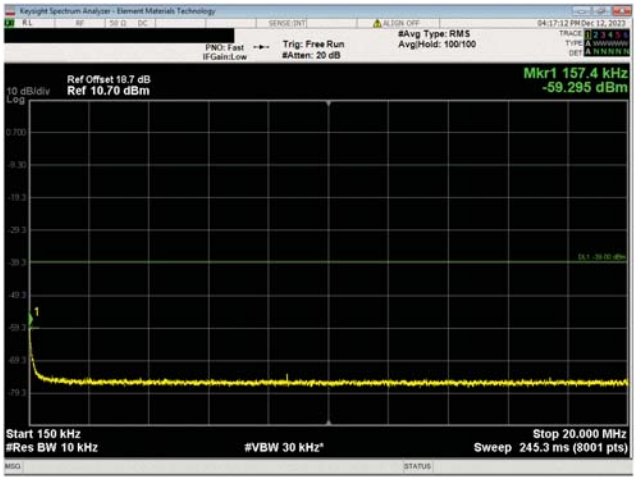
PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

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element
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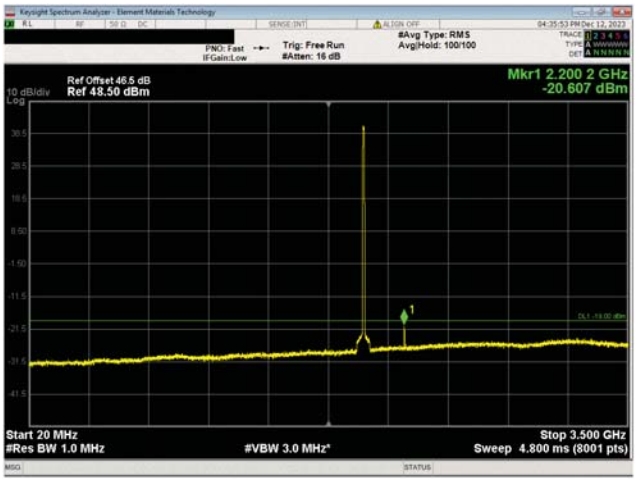
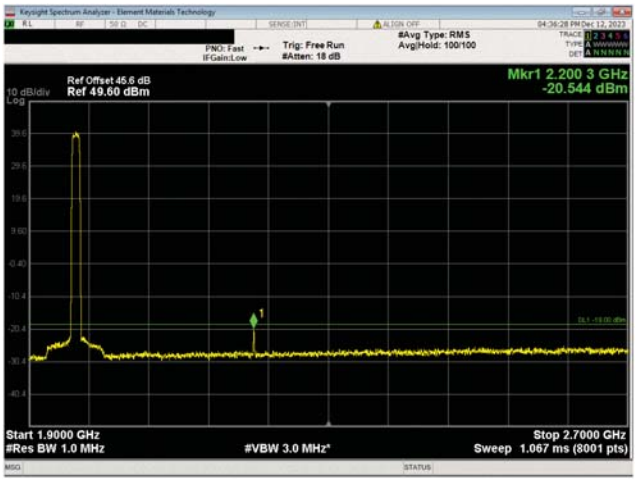
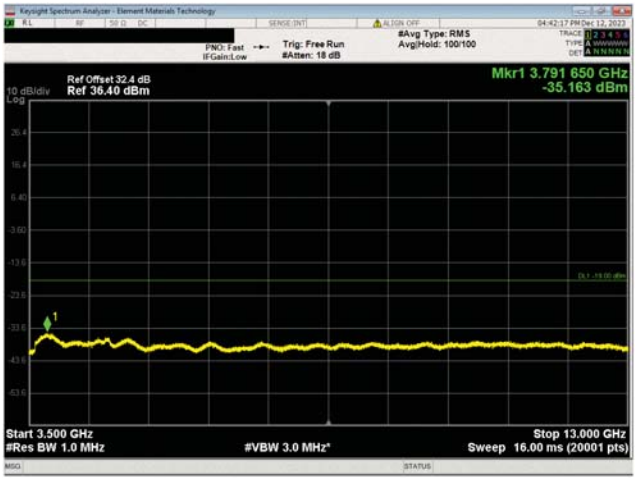


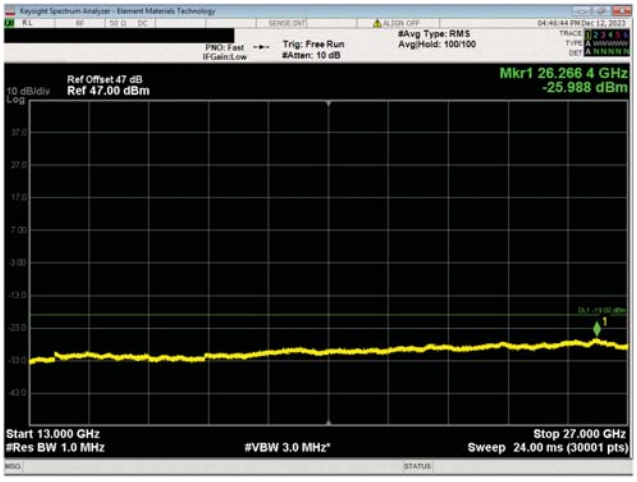
PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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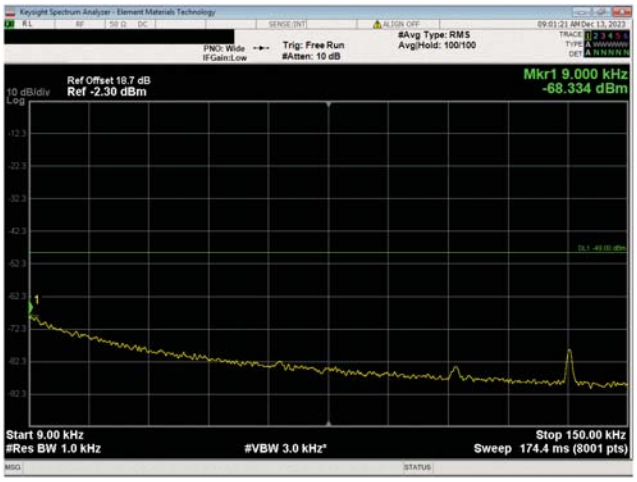
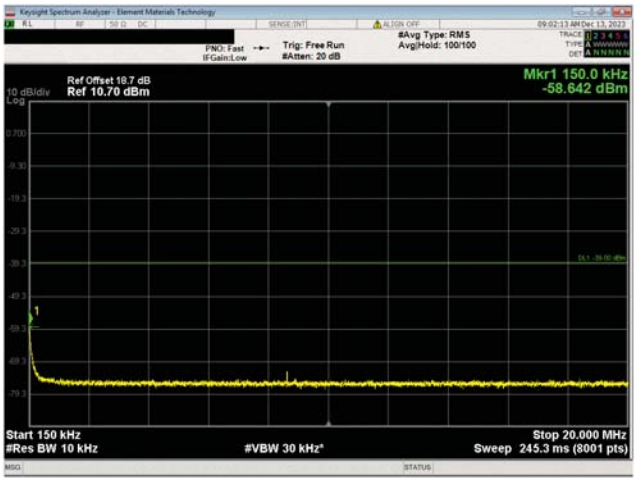
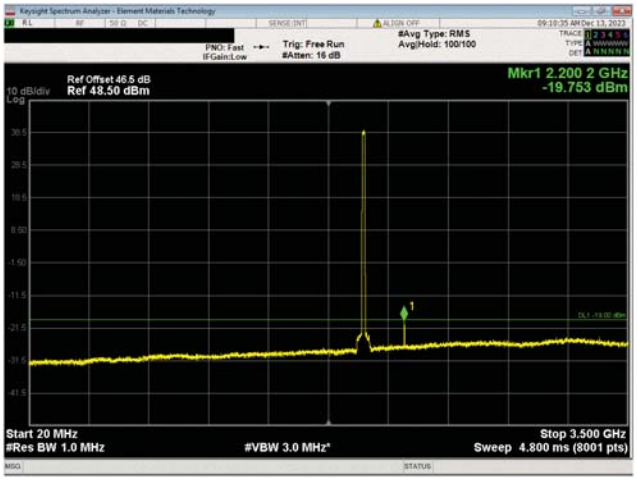


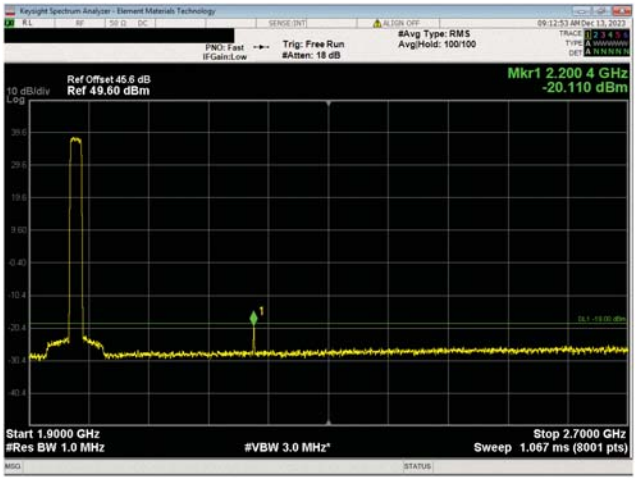
PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



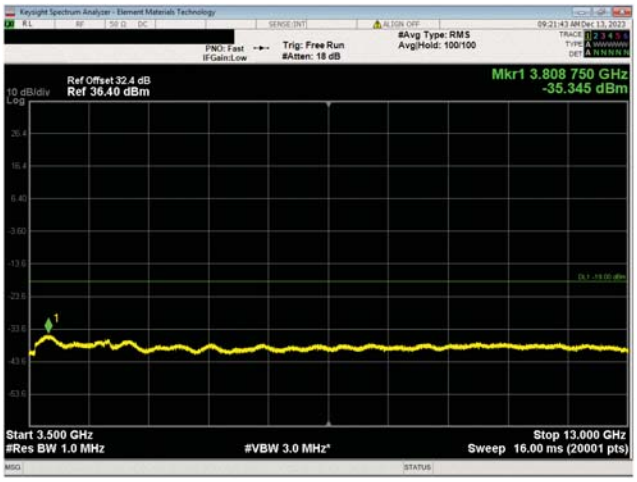
PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



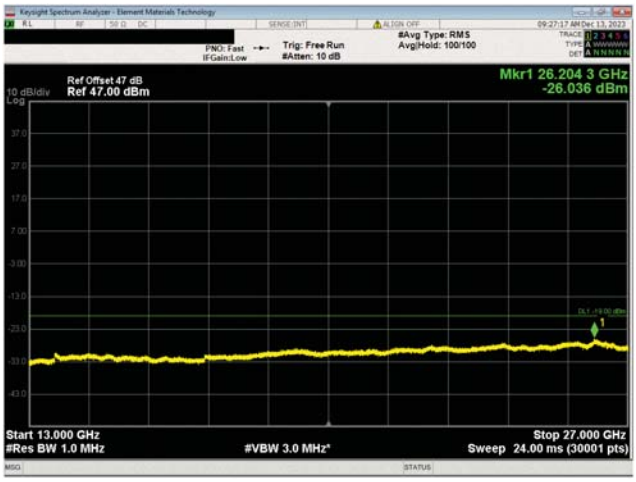
PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

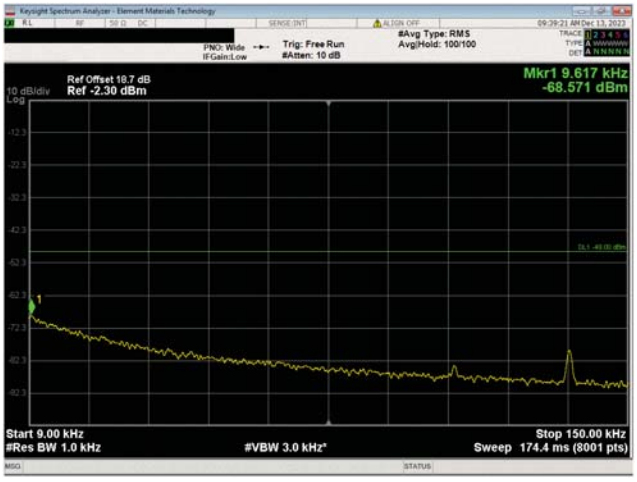
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



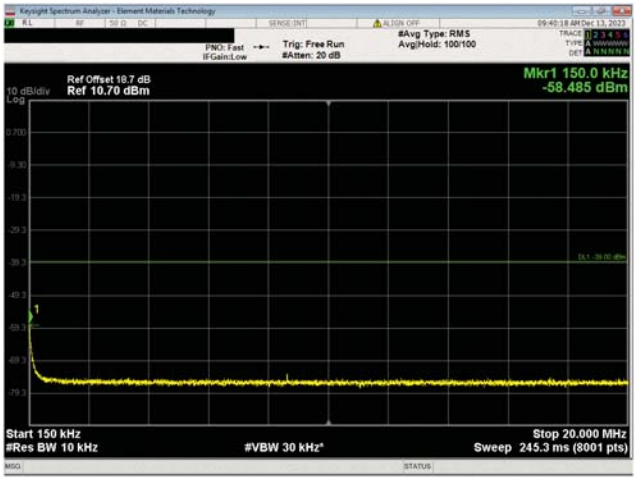
PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



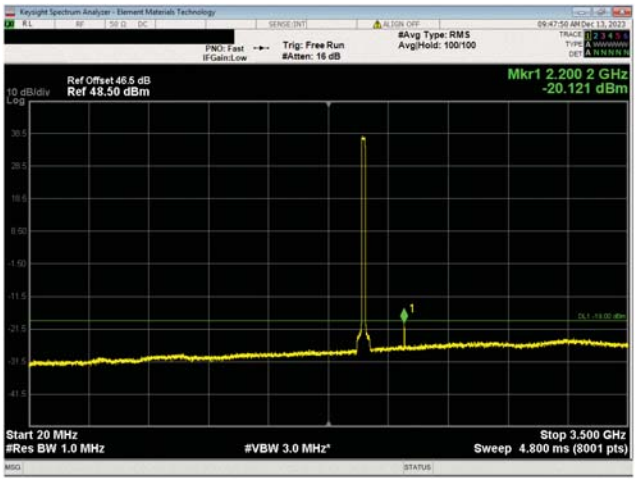
PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



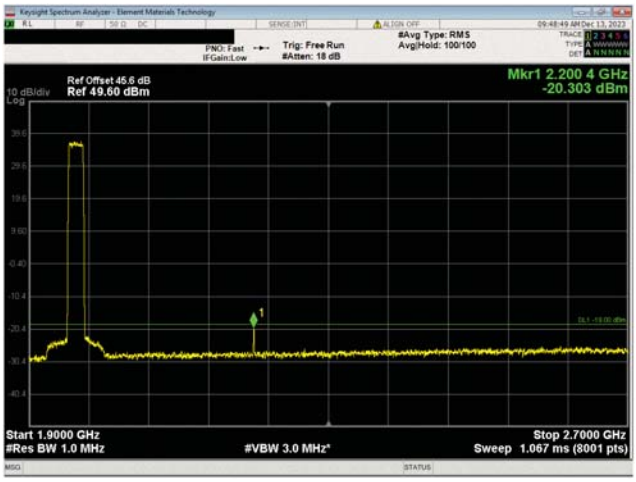
PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

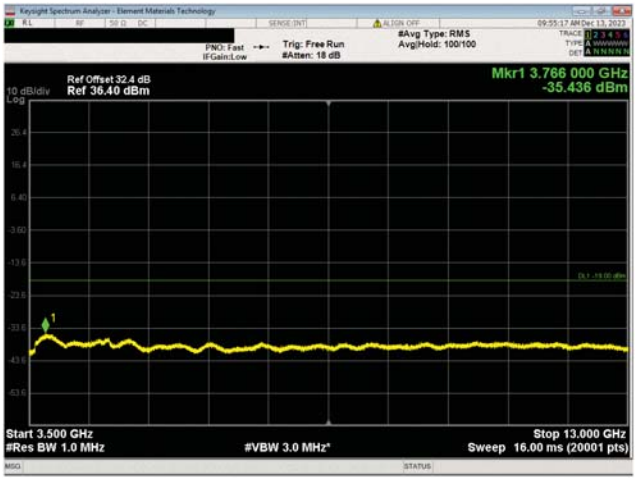
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



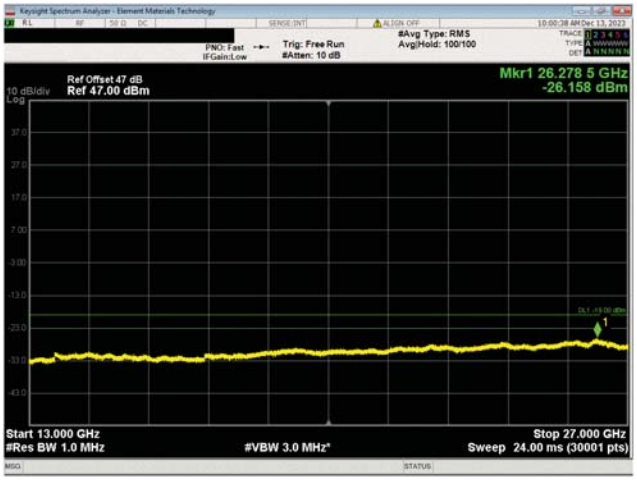
PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



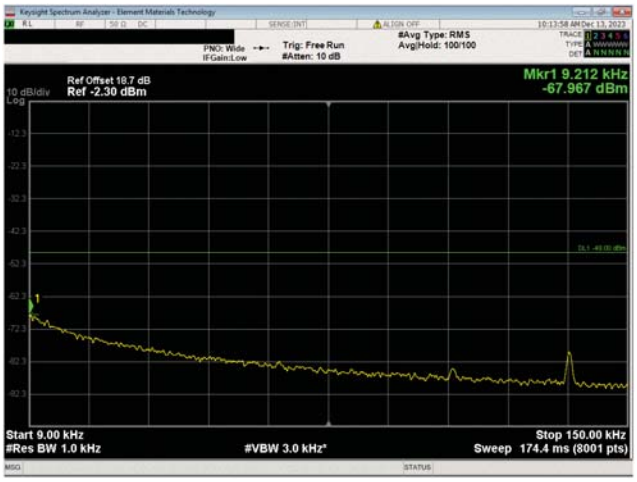
PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



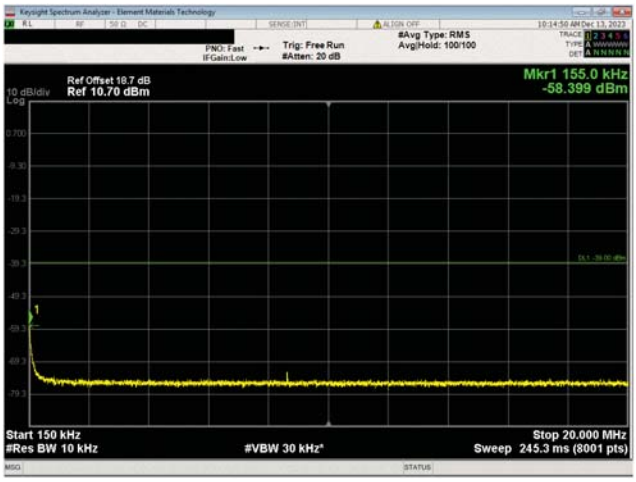
PCS Band n25, 1930 MHz - 1995 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

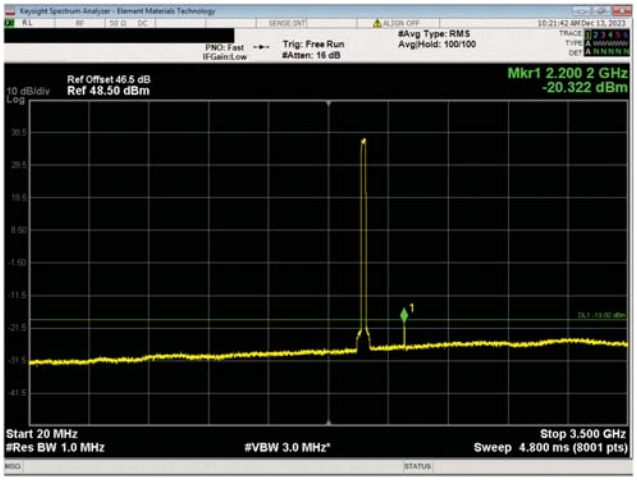
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



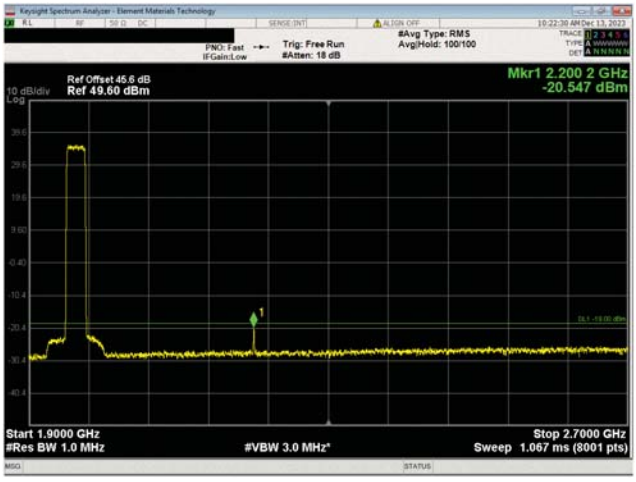
PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



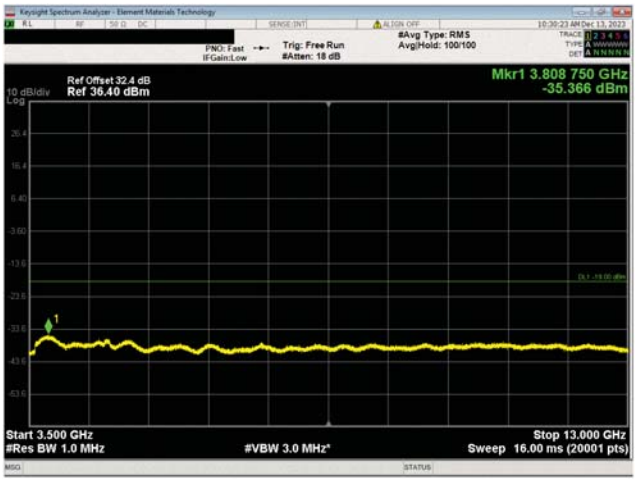
PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



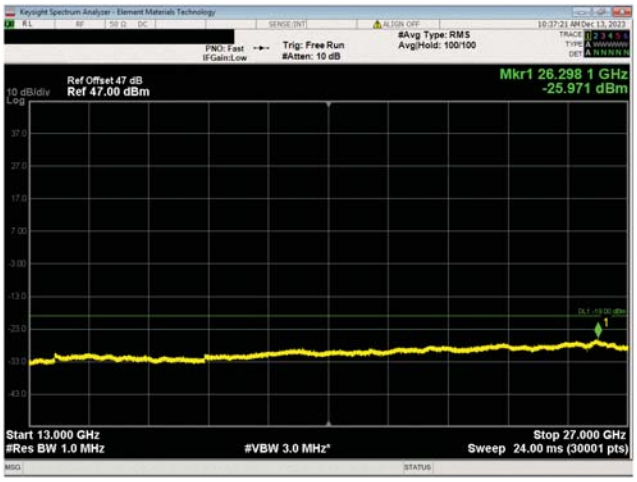
PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

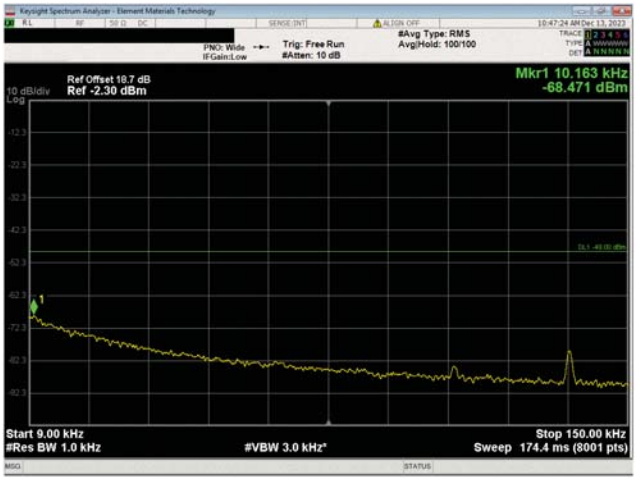
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



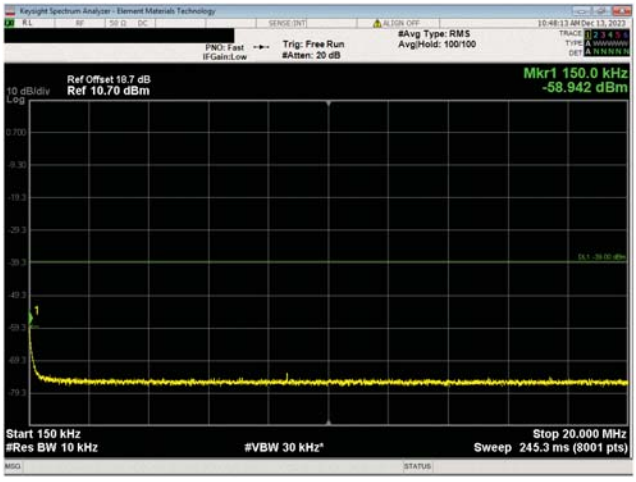
PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



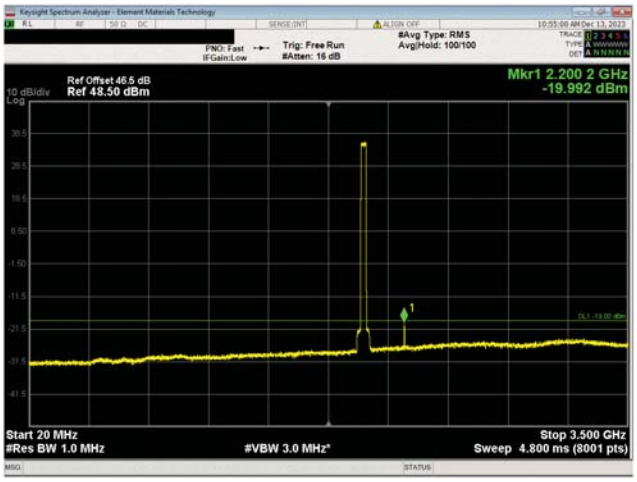
PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



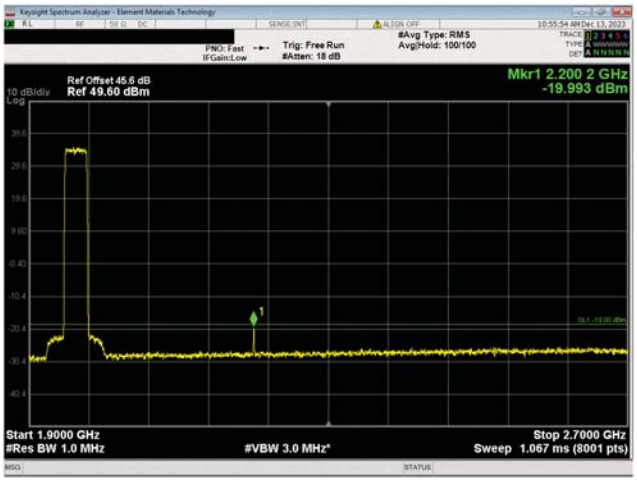
PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

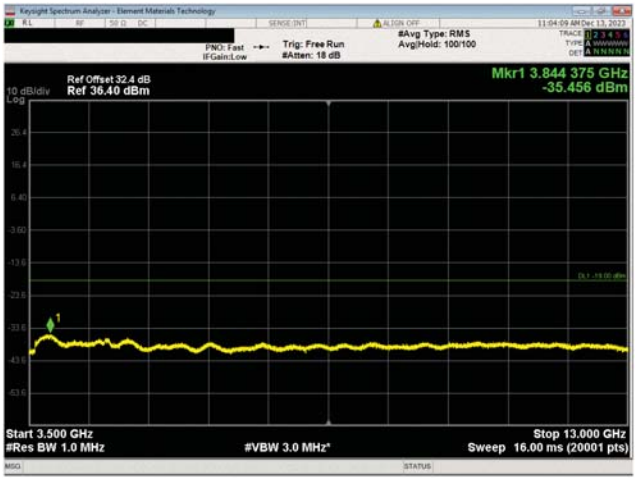
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



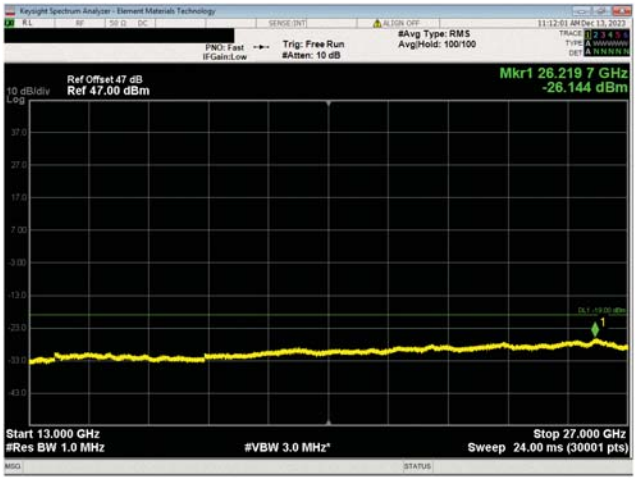
PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



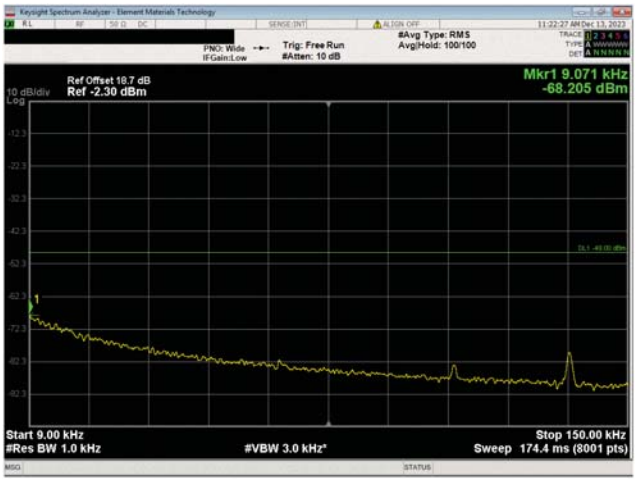
PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



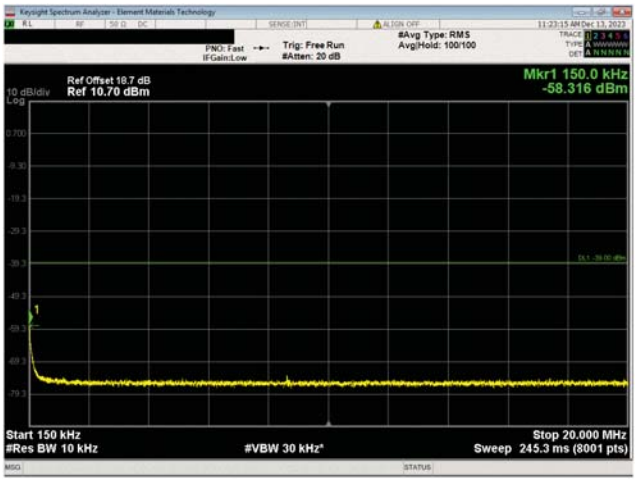
PCS Band n25, 1930 MHz - 1995 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

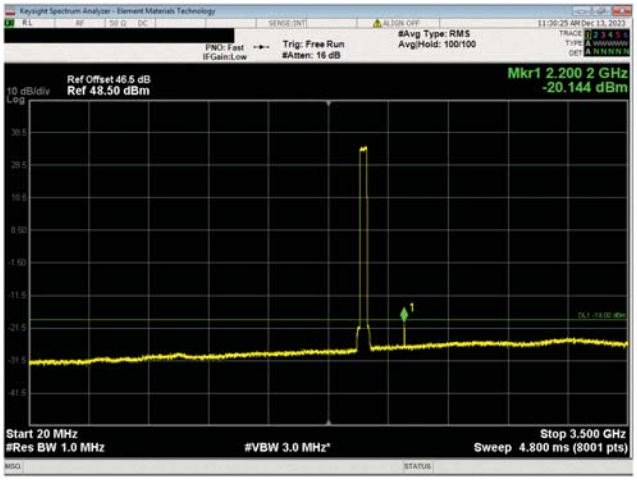
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

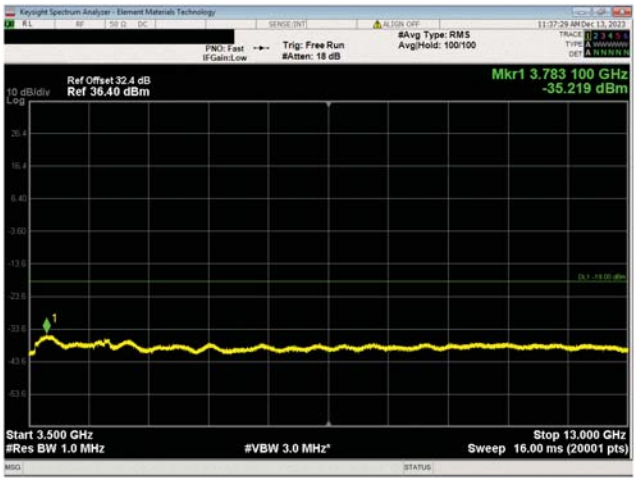


PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

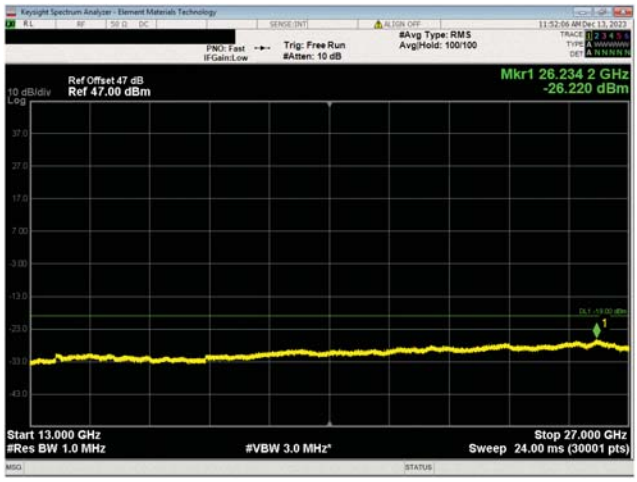
PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz

SPURIOUS CONDUCTED EMISSIONS

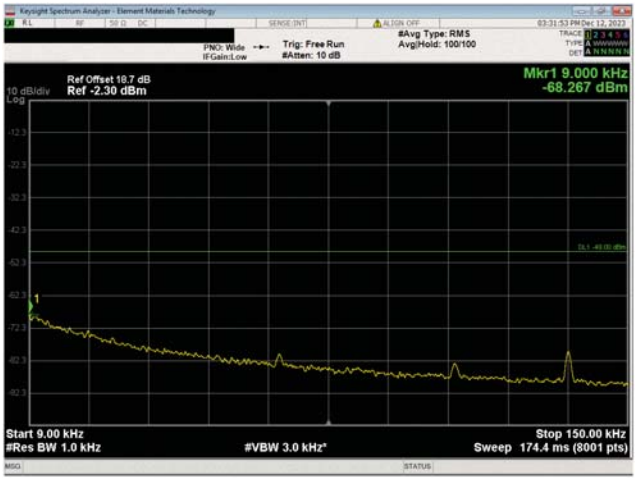
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



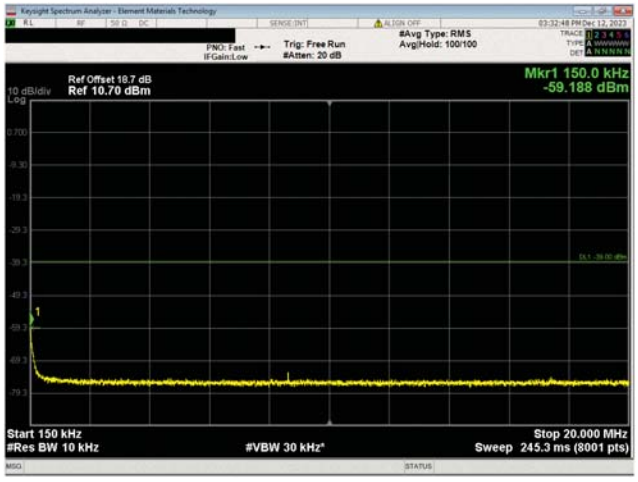
PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



PCS Band n25, 1930 MHz - 1995 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 1962.5 MHz



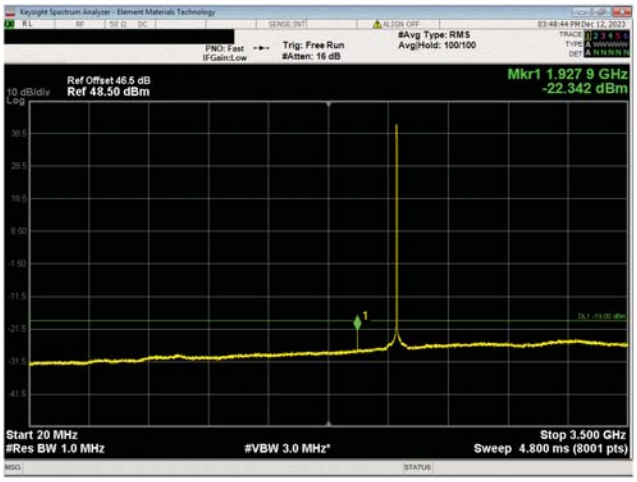
AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



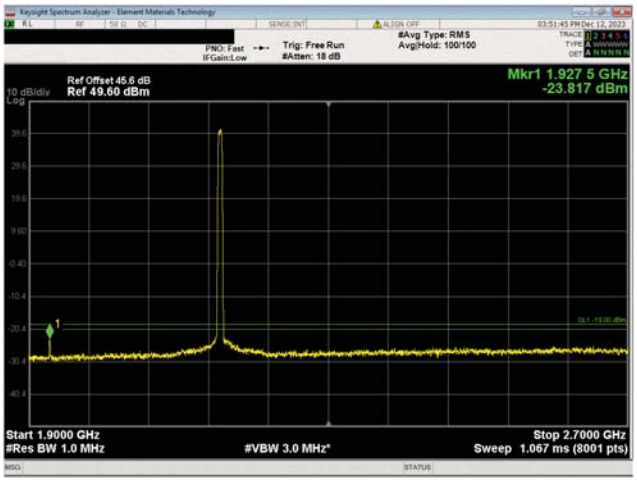
AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

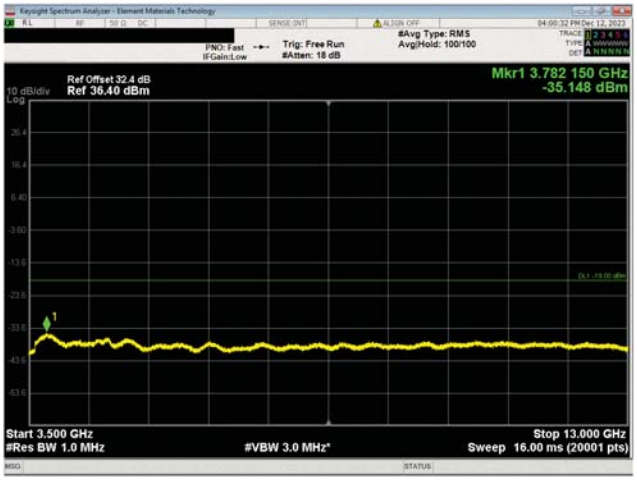
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



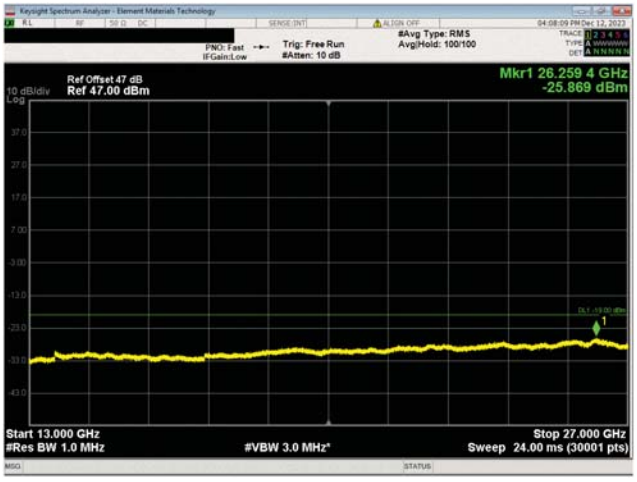
AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



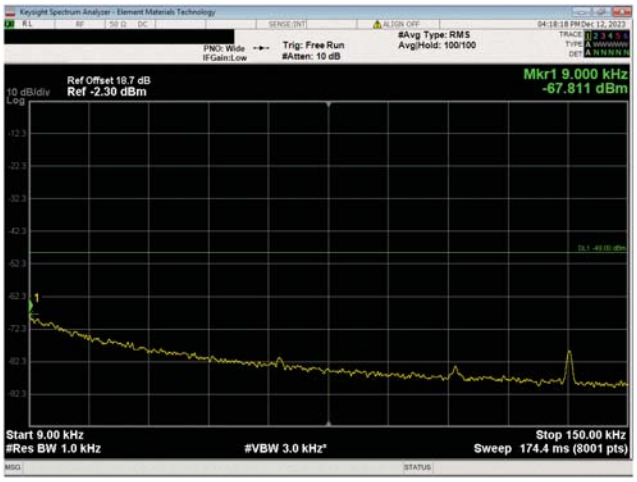
AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



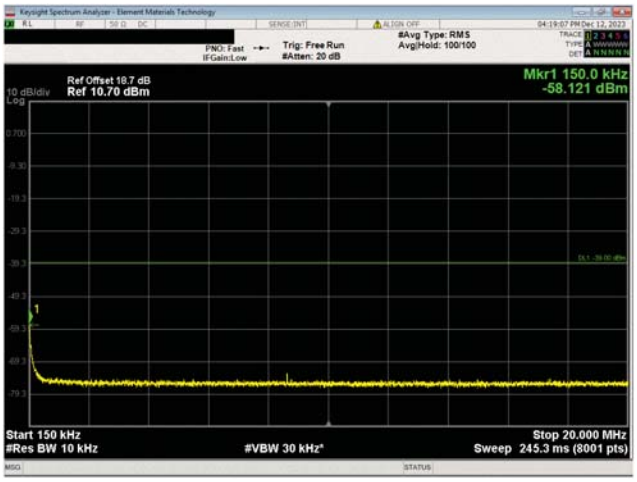
AWS Band n66, 2110 MHz - 2200 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

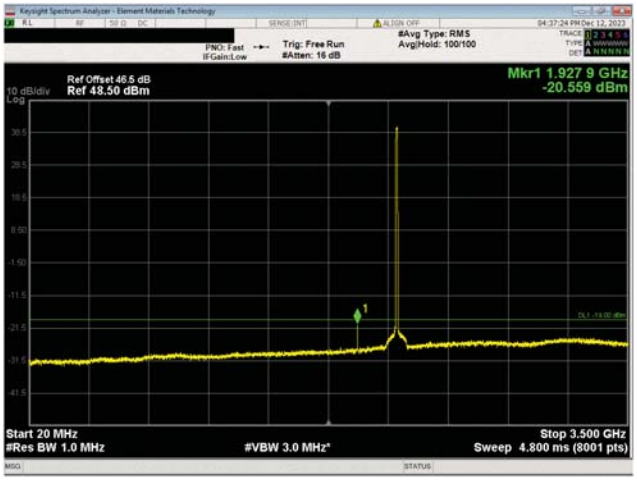
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



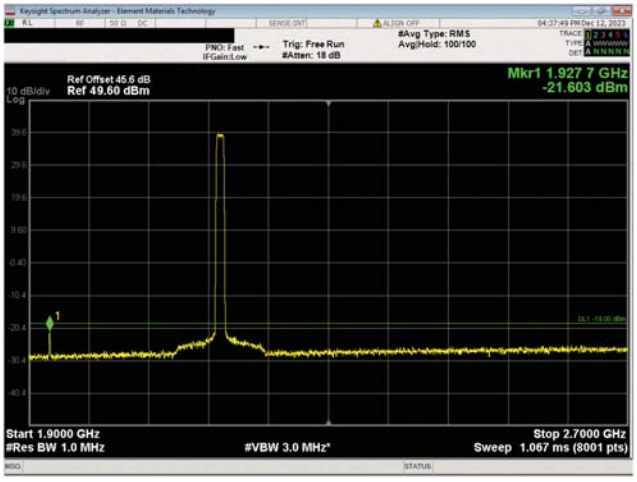
AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



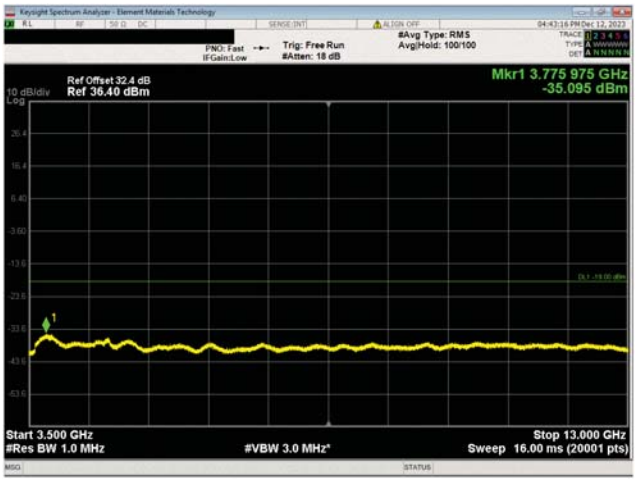
AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



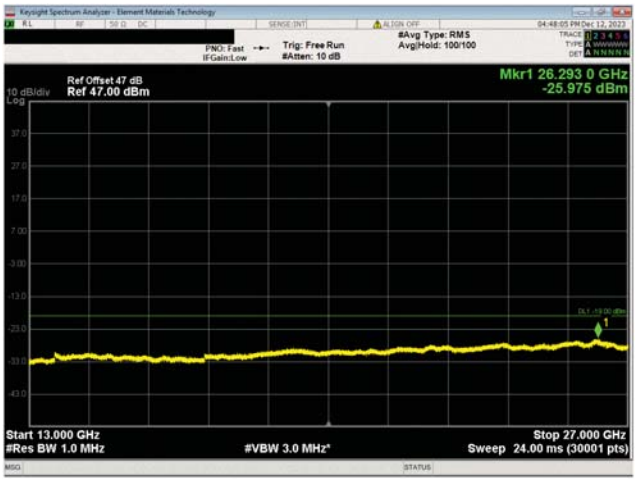
AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

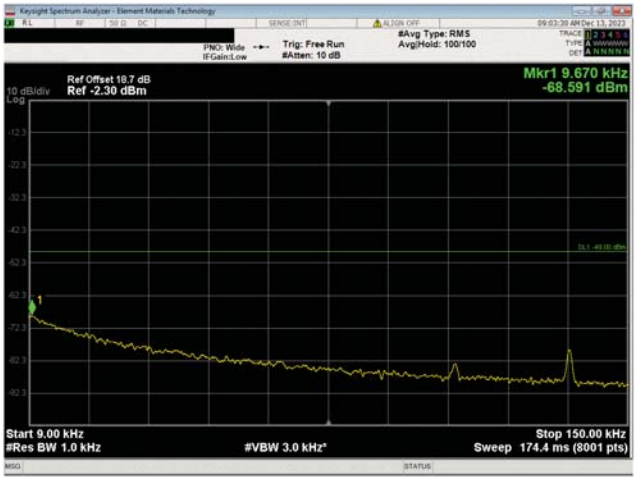
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



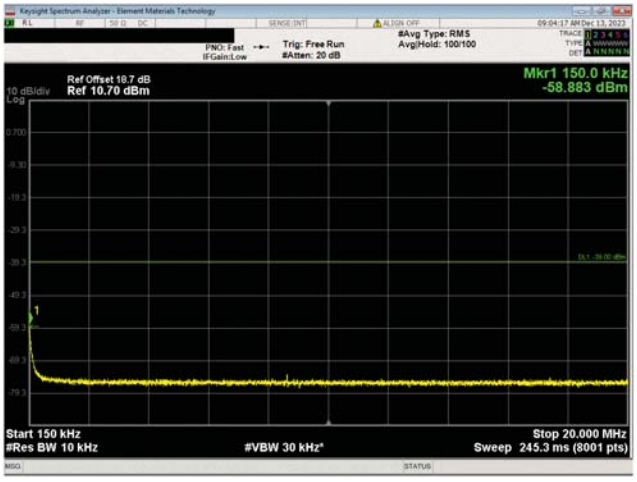
AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



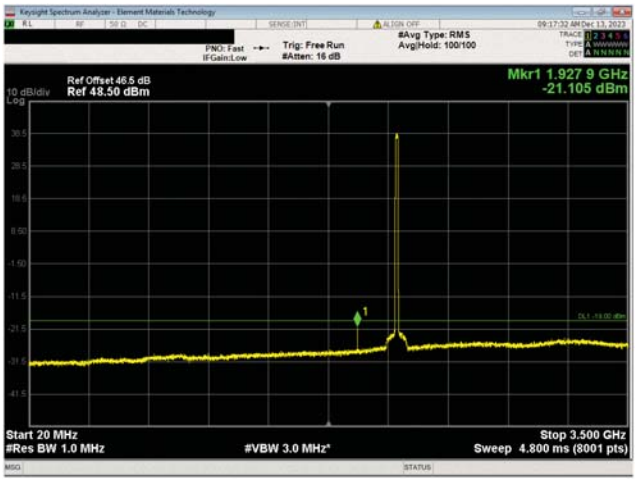
AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



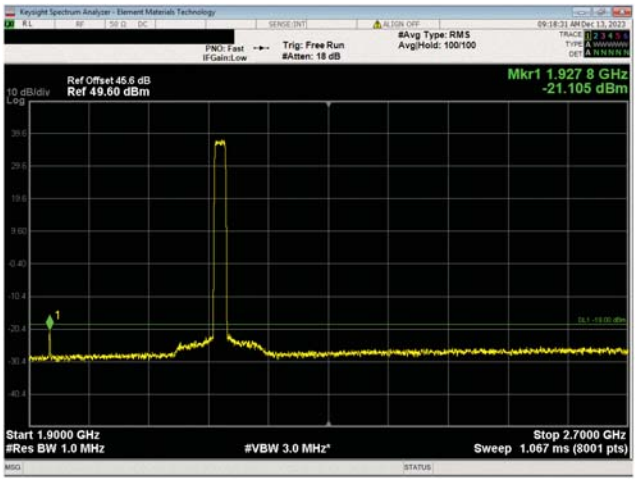
AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

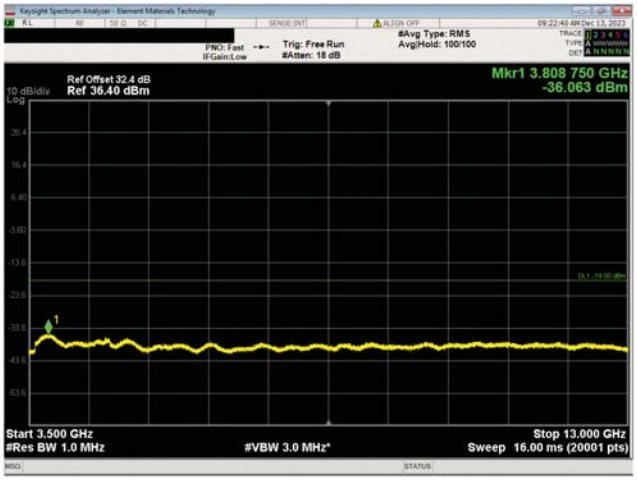
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



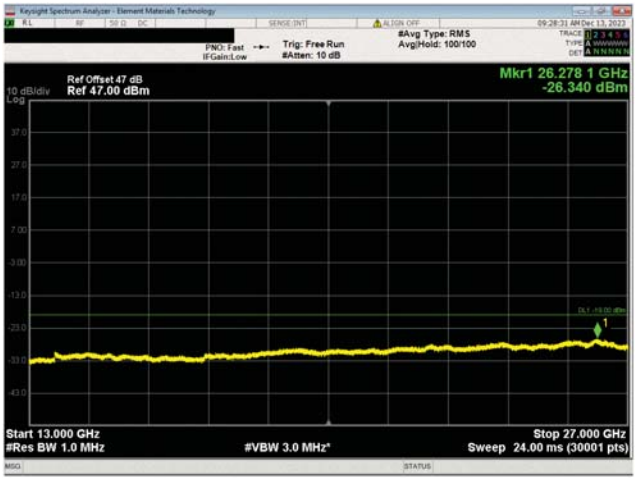
AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



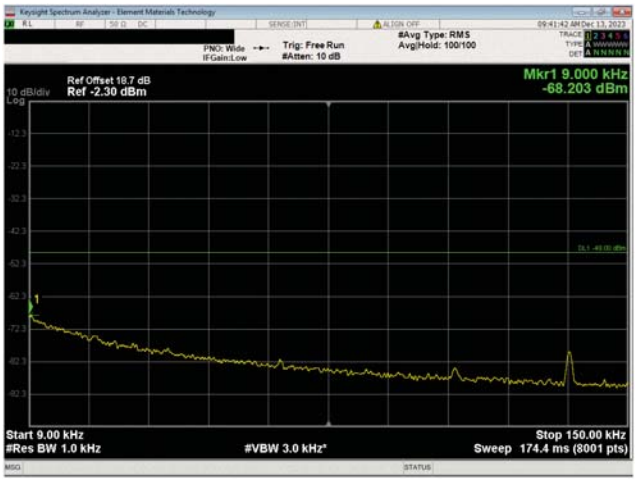
AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



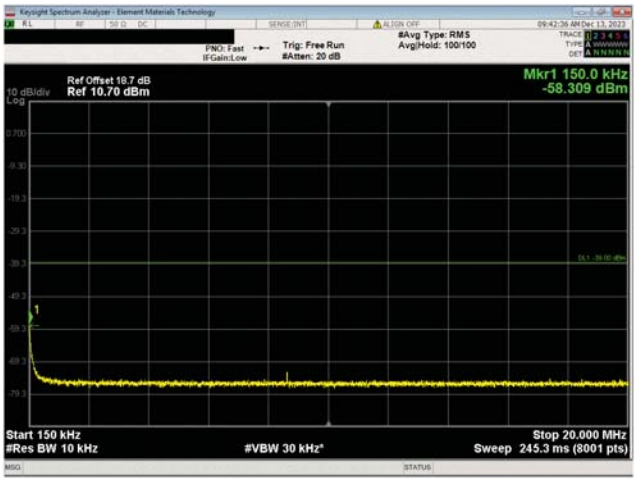
AWS Band n66, 2110 MHz - 2200 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

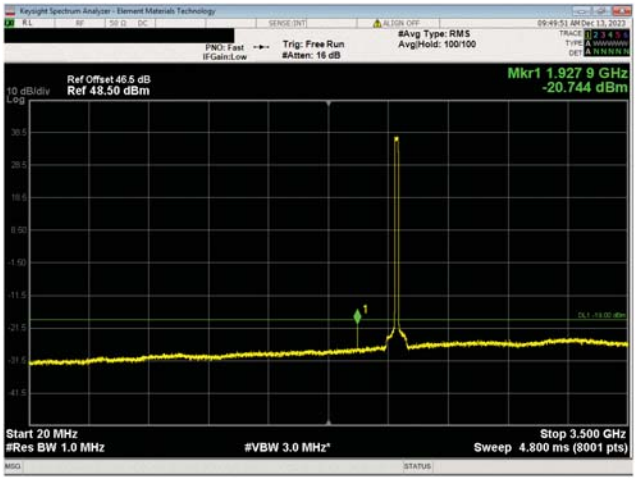
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



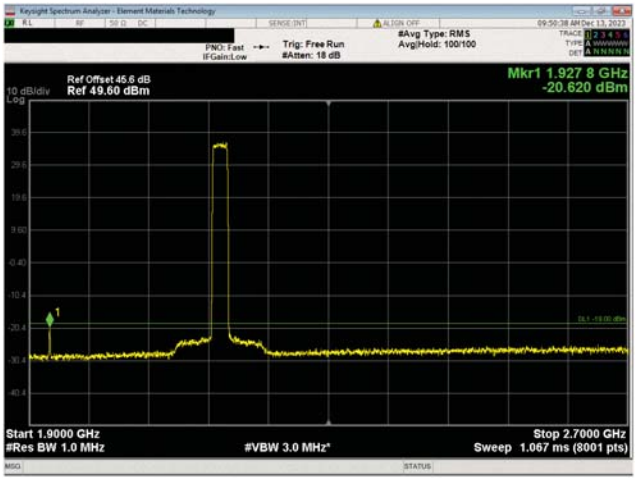
AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



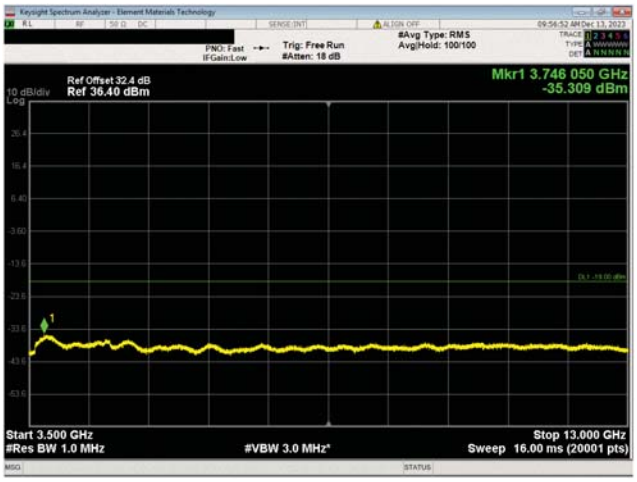
AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



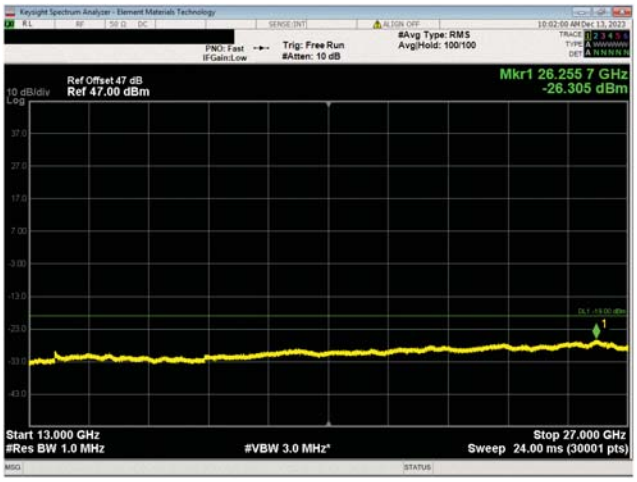
AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

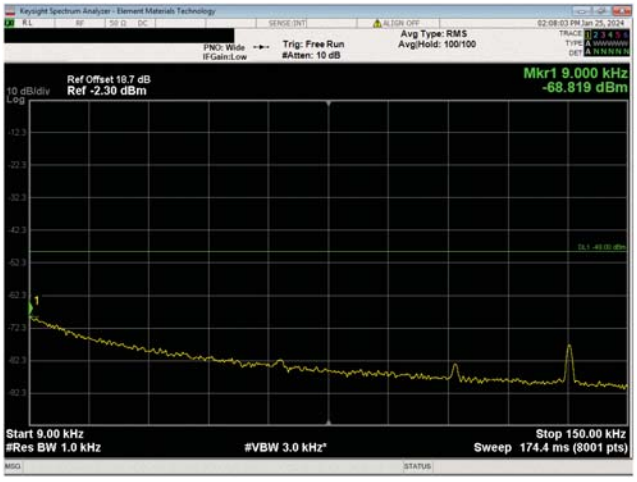
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



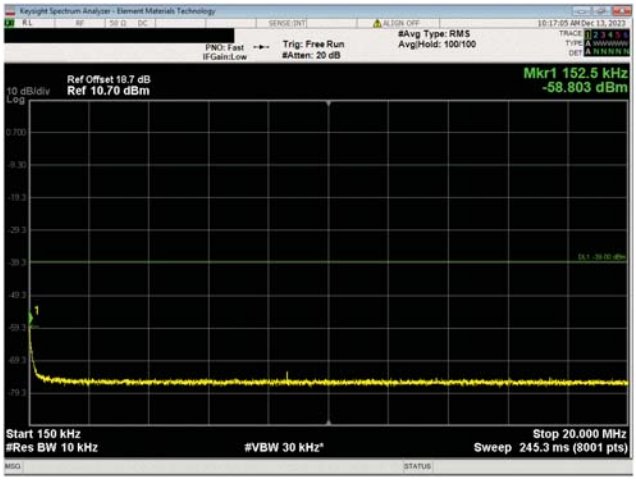
AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



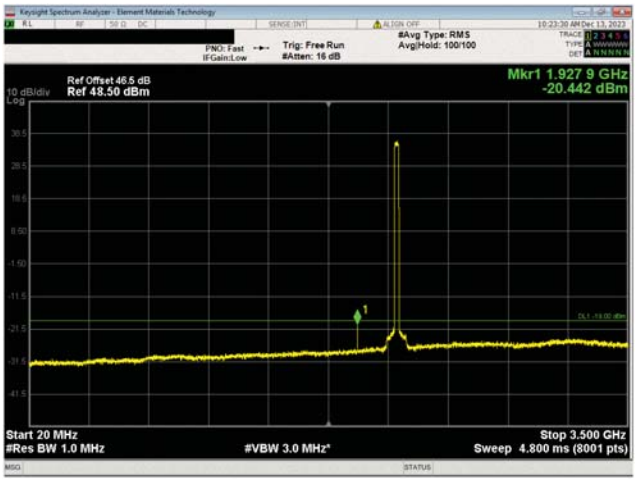
AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



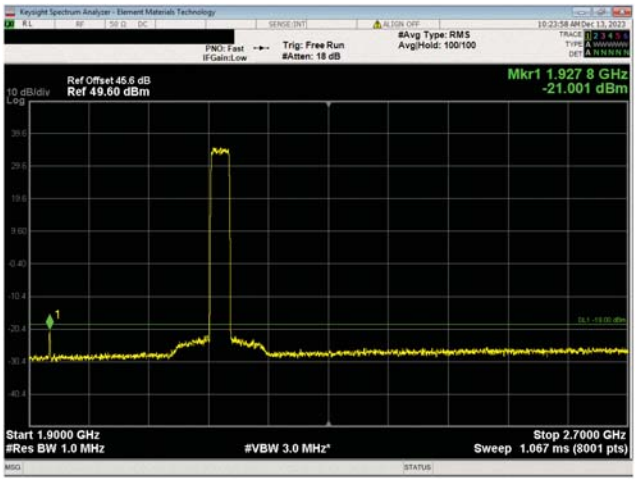
AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

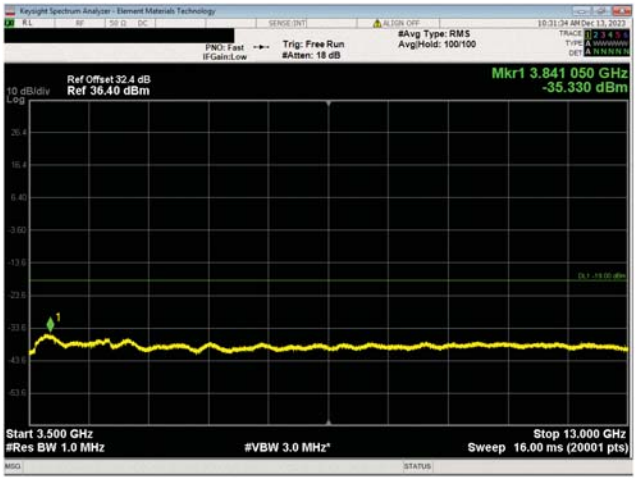
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



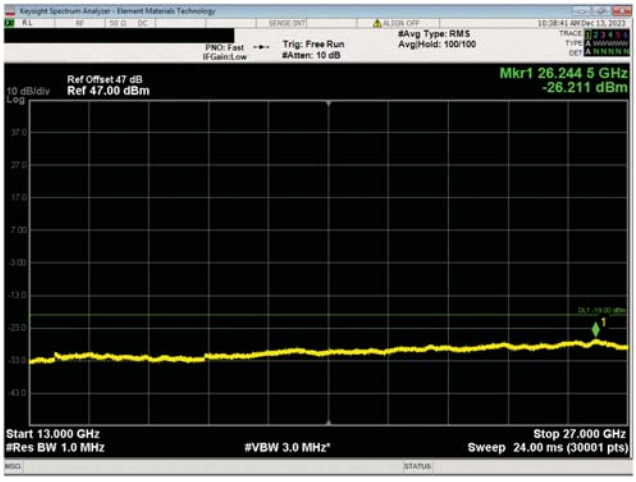
AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



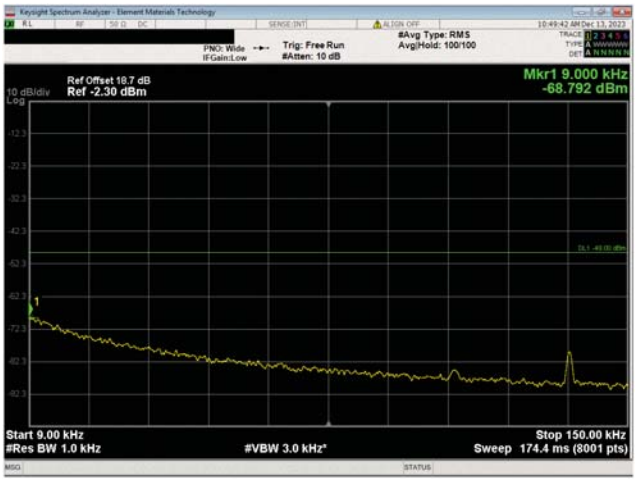
AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



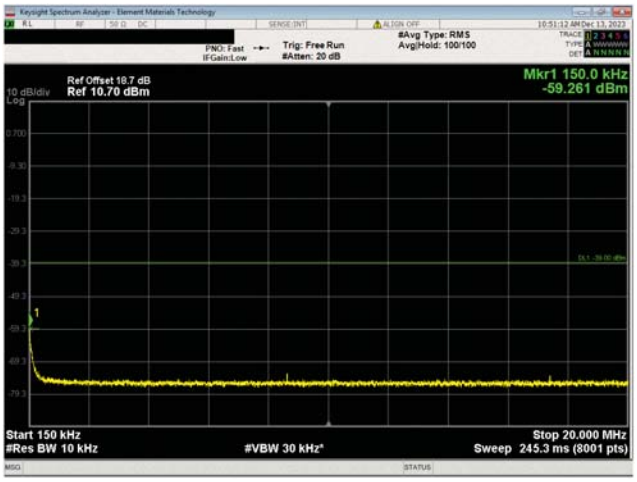
AWS Band n66, 2110 MHz - 2200 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

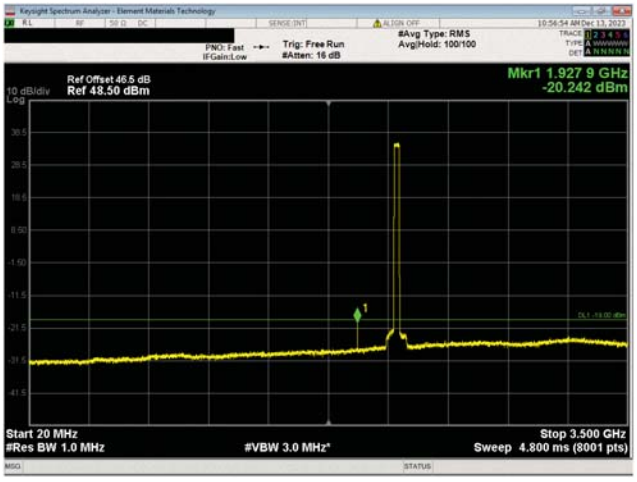
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



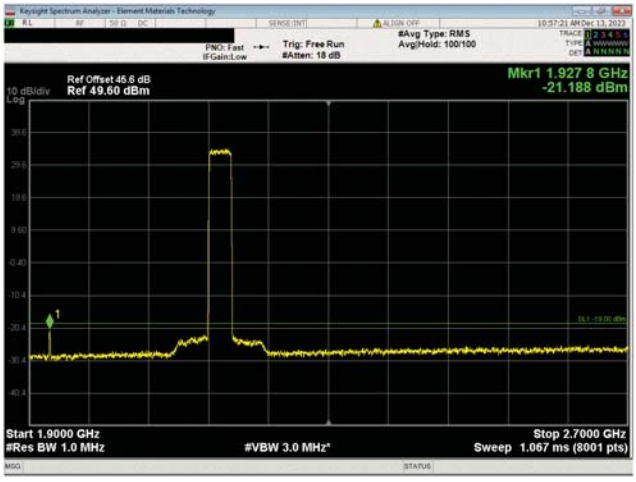
AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



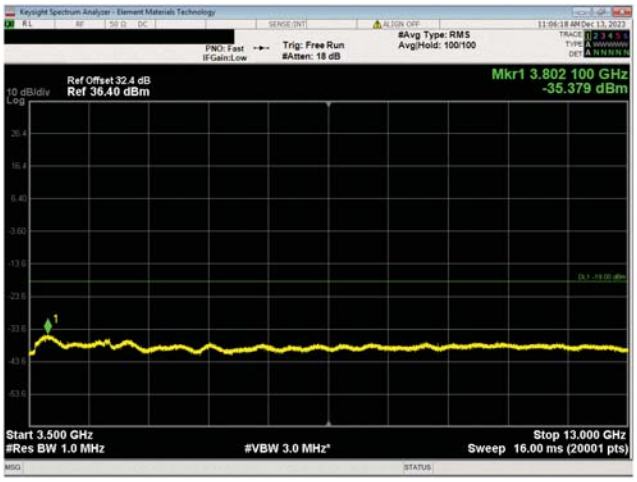
AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



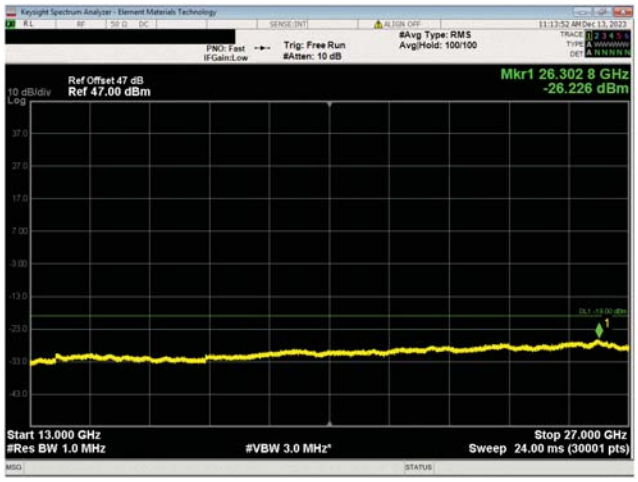
AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

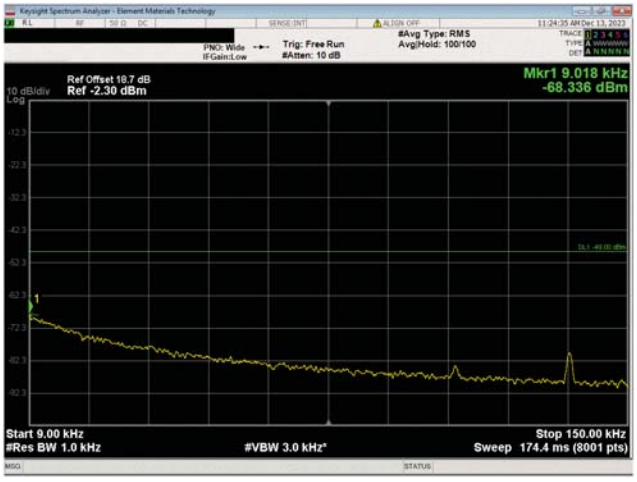
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



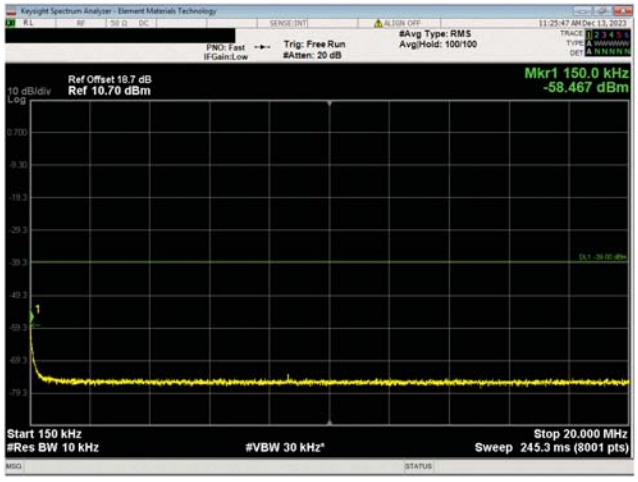
AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



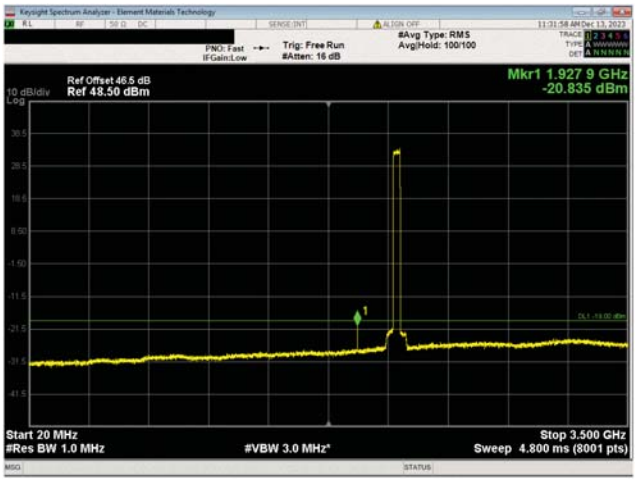
AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



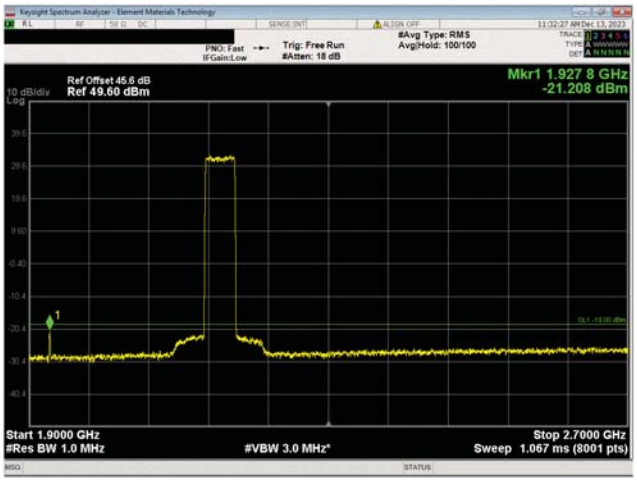
AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

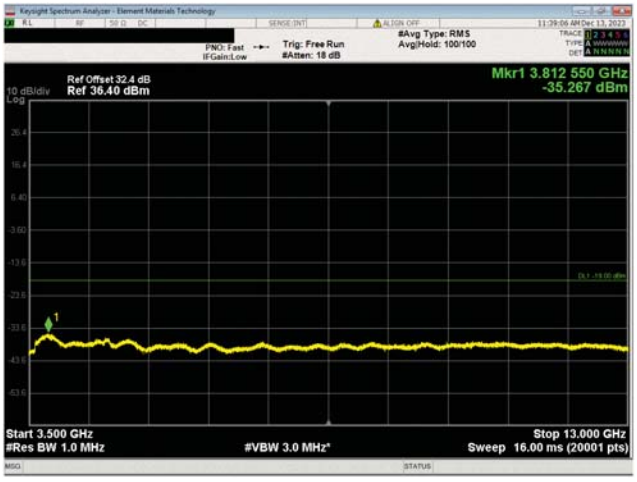
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



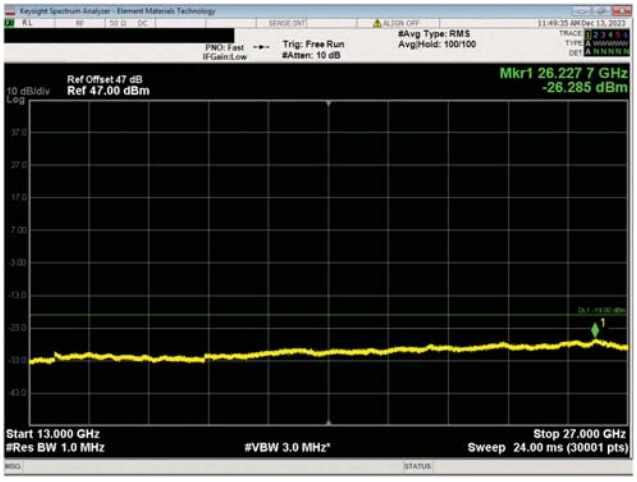
AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



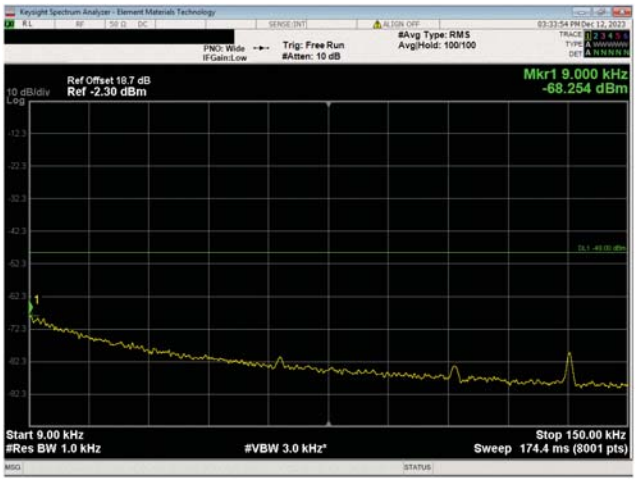
AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz



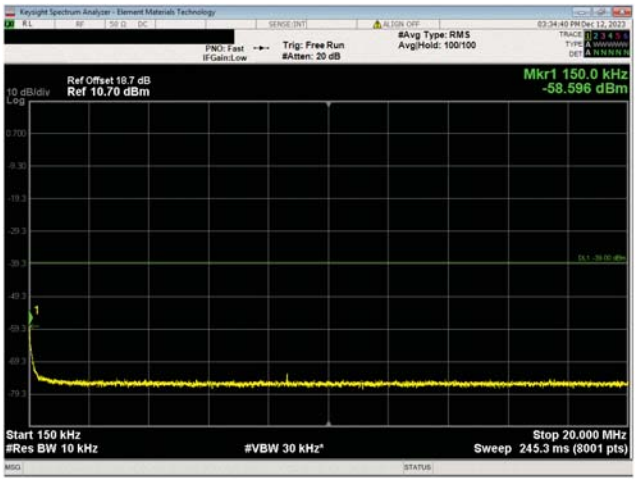
AWS Band n66, 2110 MHz - 2200 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2155.0 MHz

SPURIOUS CONDUCTED EMISSIONS

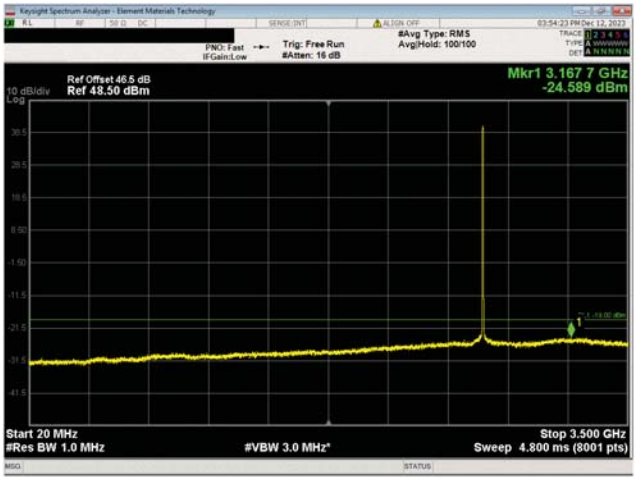
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



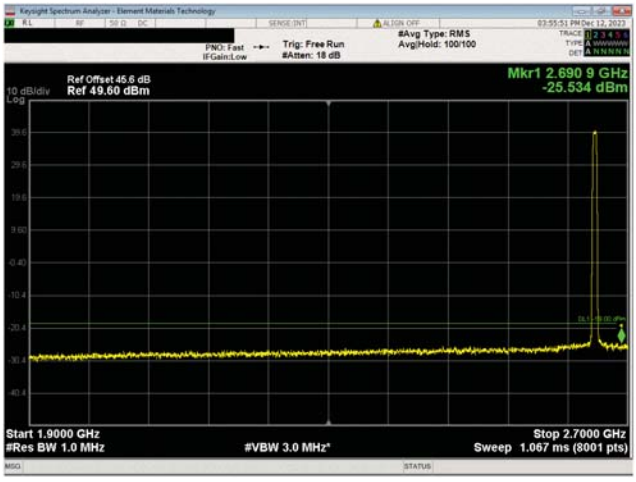
BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



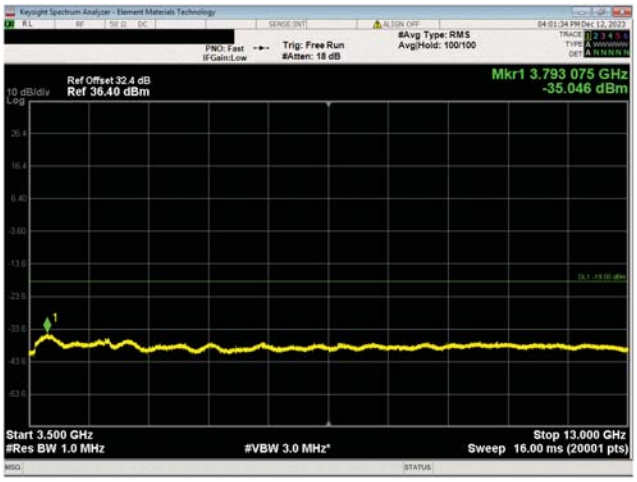
BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



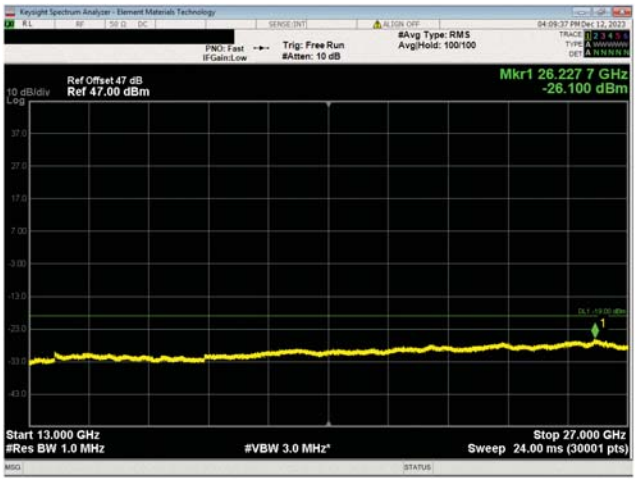
BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

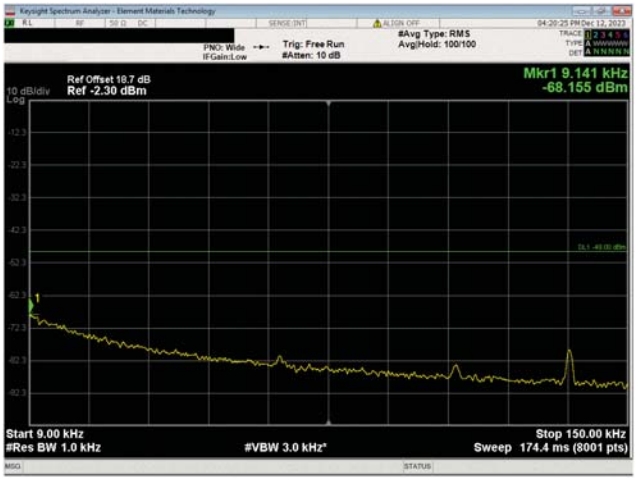
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



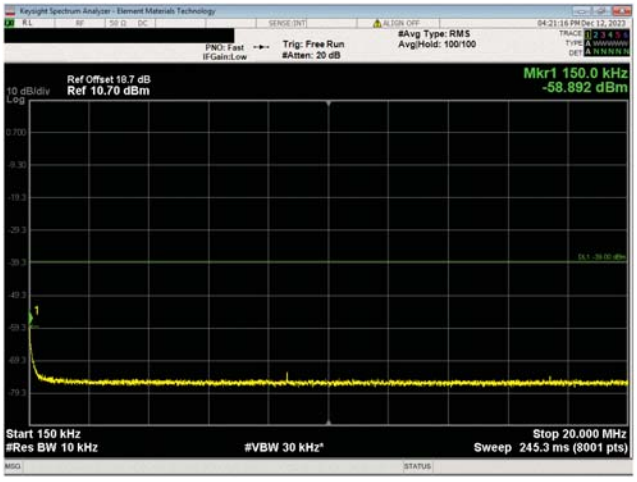
BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
5 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



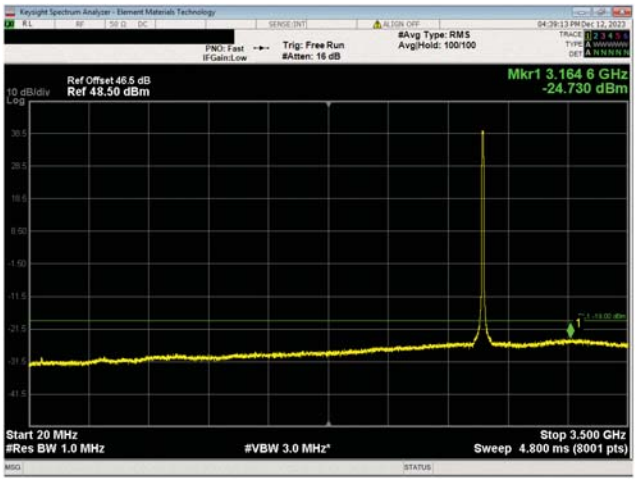
BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



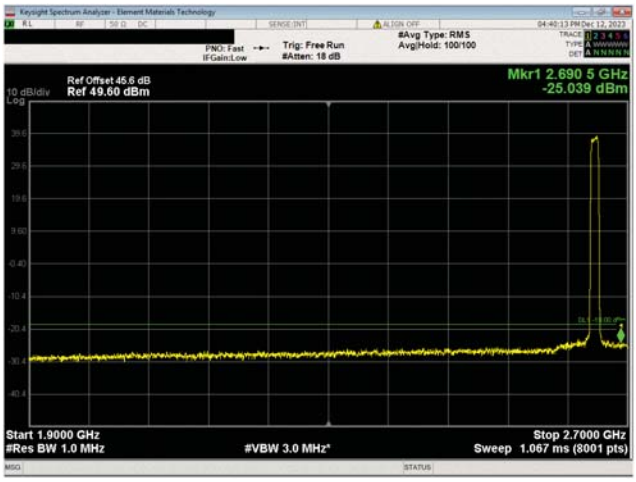
BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

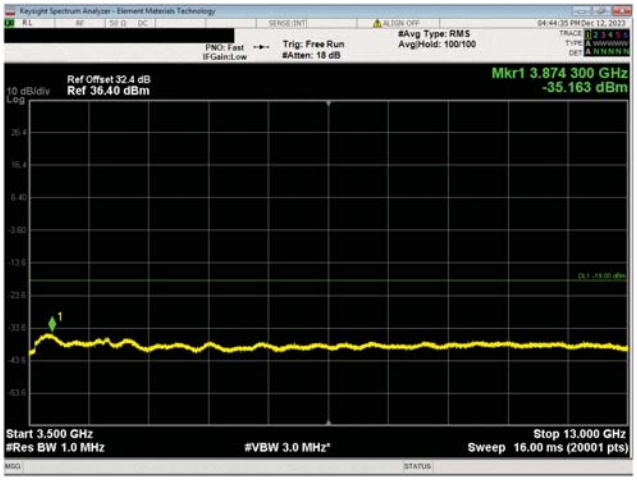
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



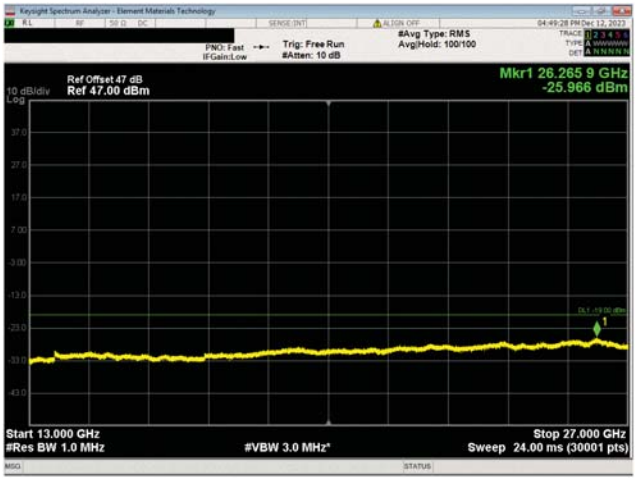
BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



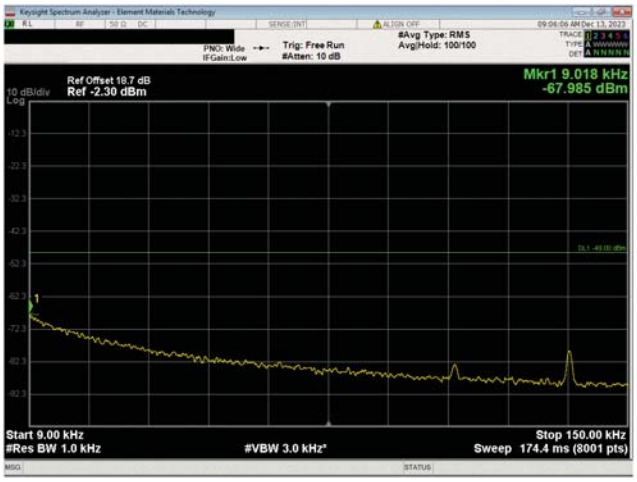
BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



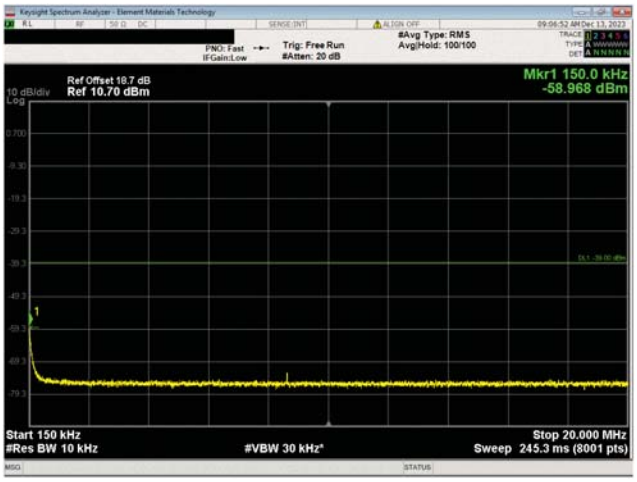
BRS Band n7, 2620 MHz - 2690 MHz
10 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

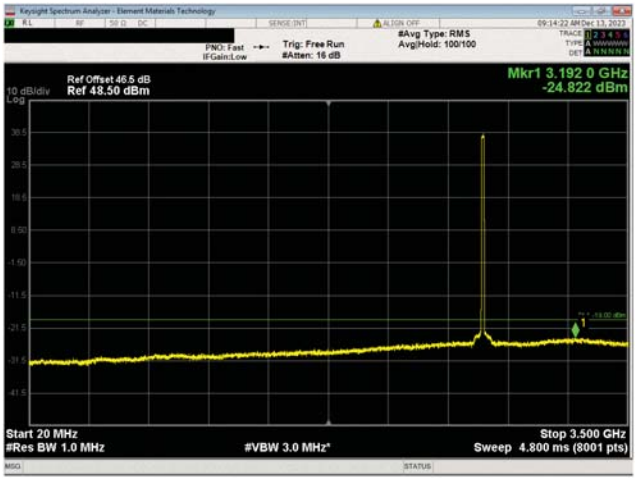
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



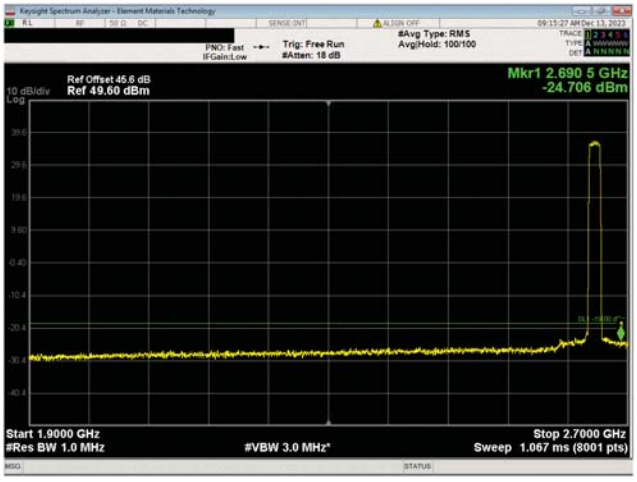
BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



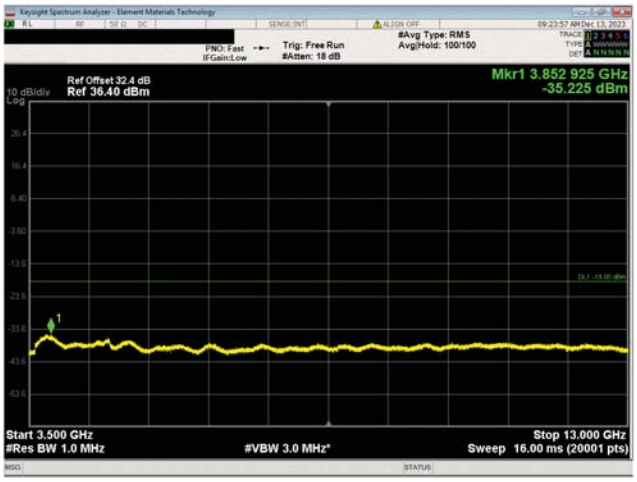
BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



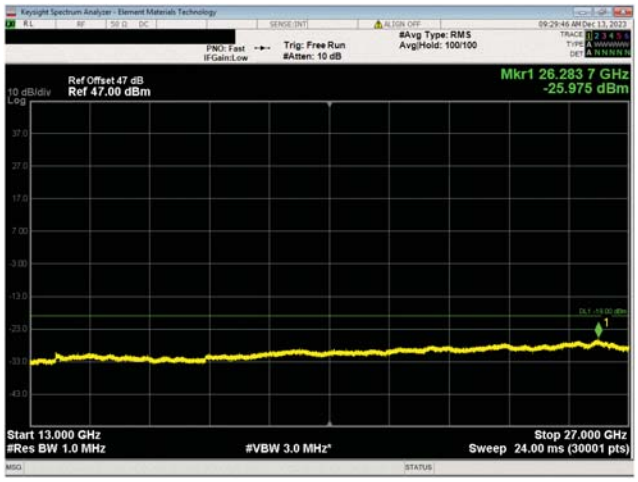
BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

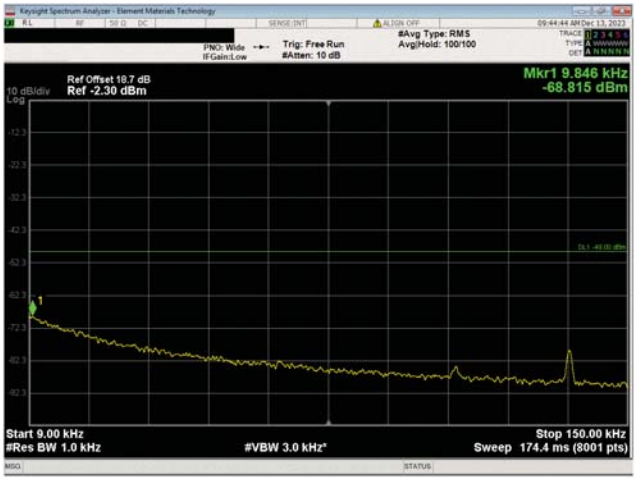
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



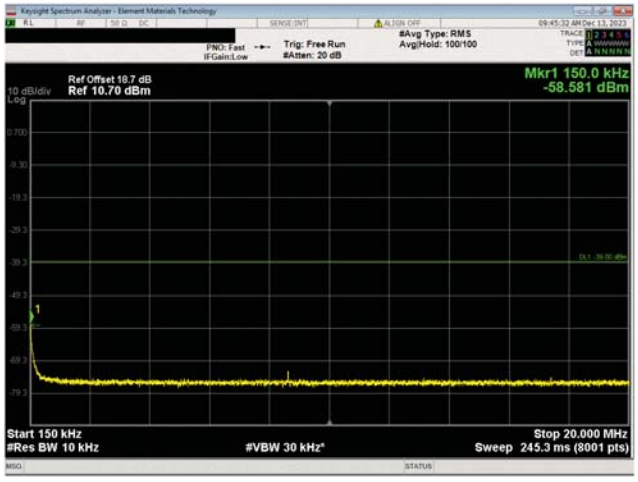
BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
15 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



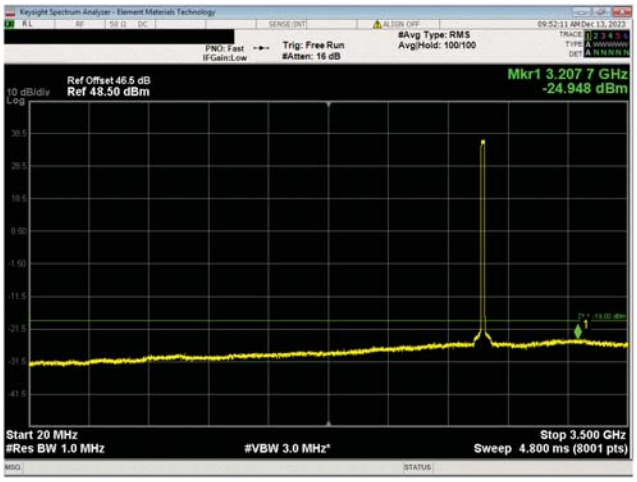
BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



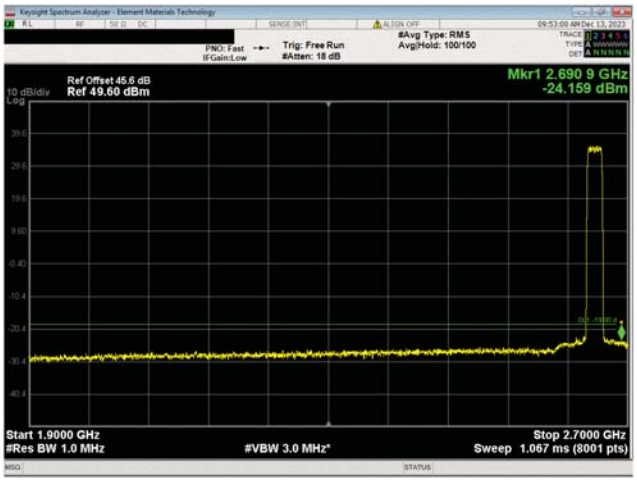
BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

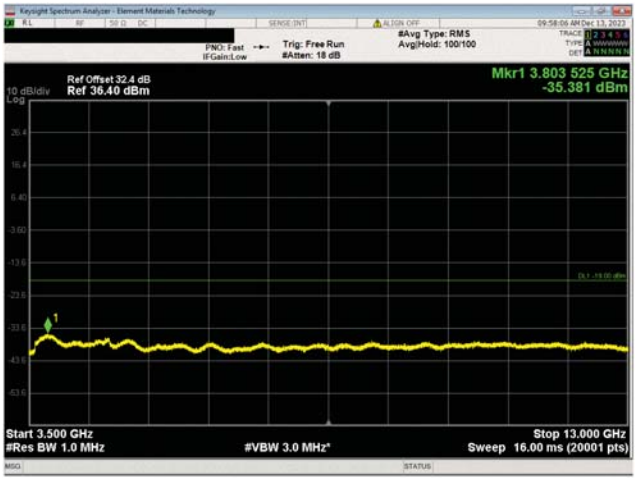
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



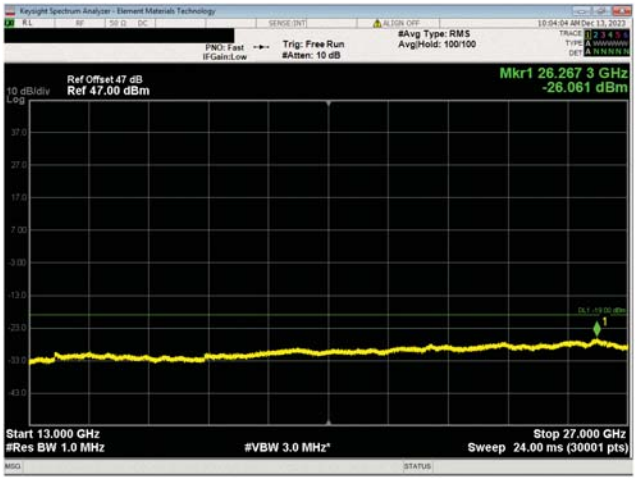
BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



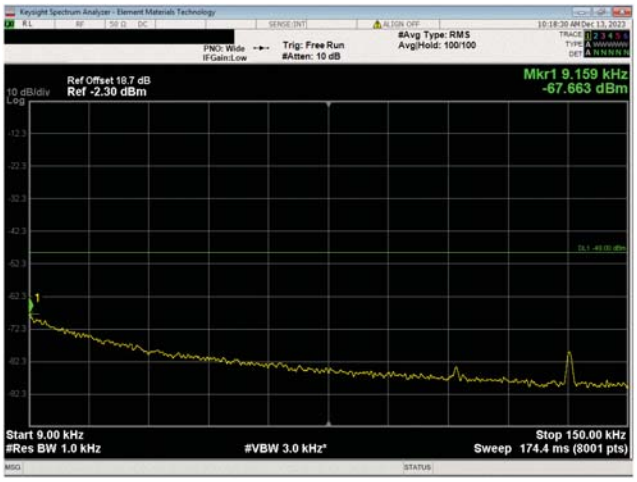
BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



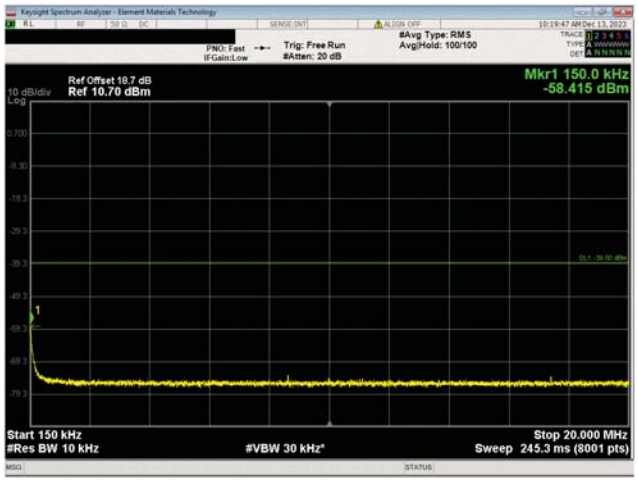
BRS Band n7, 2620 MHz - 2690 MHz
20 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

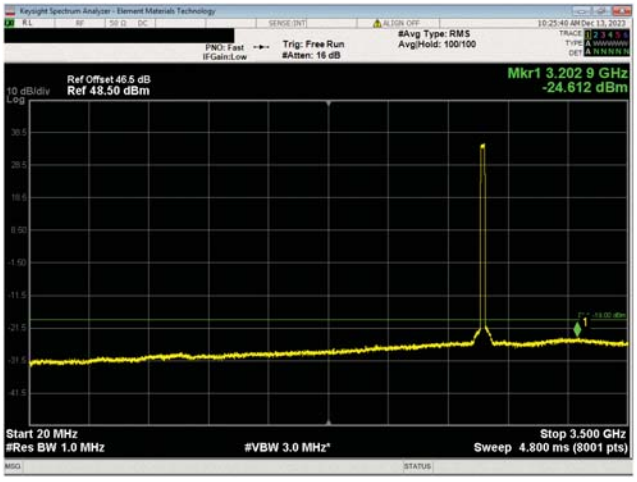
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



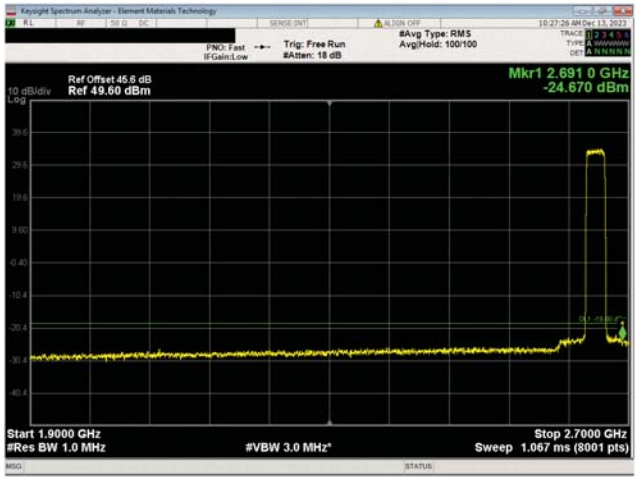
BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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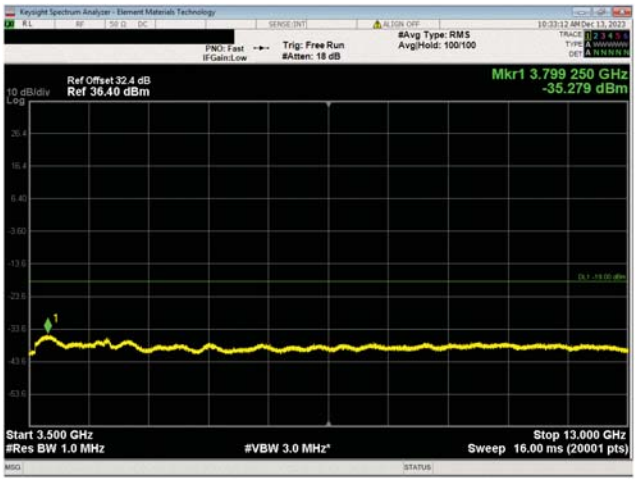
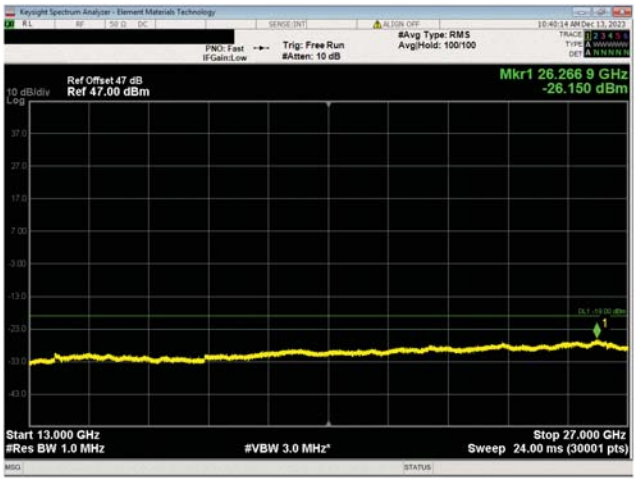
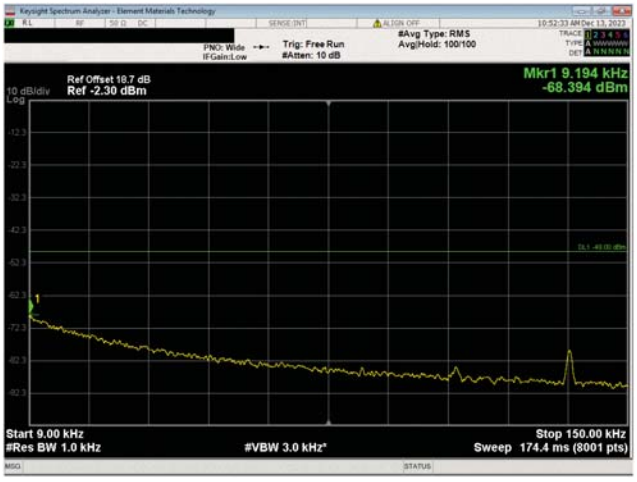


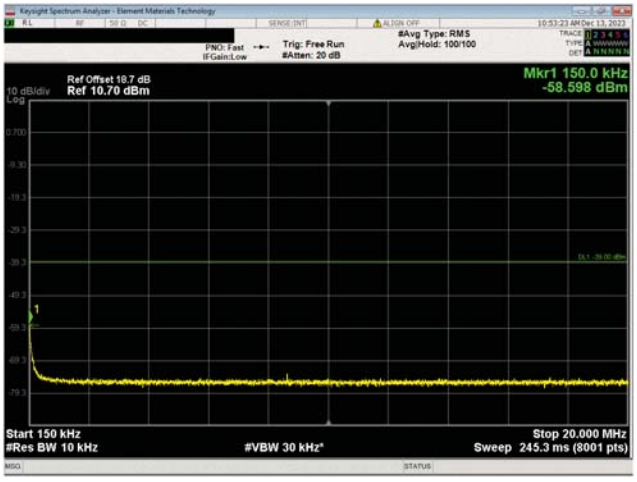
BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
25 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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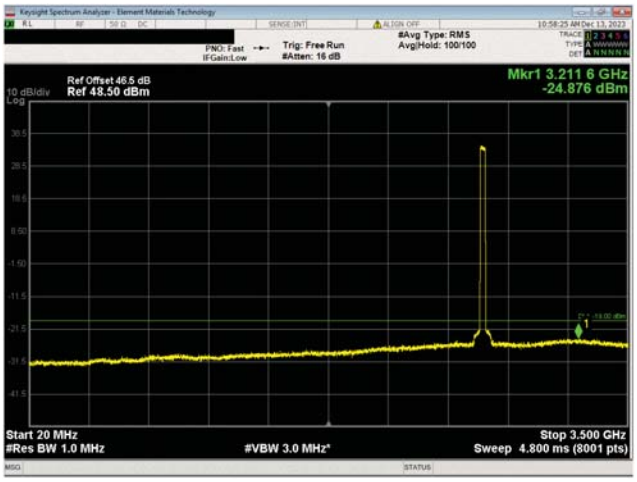
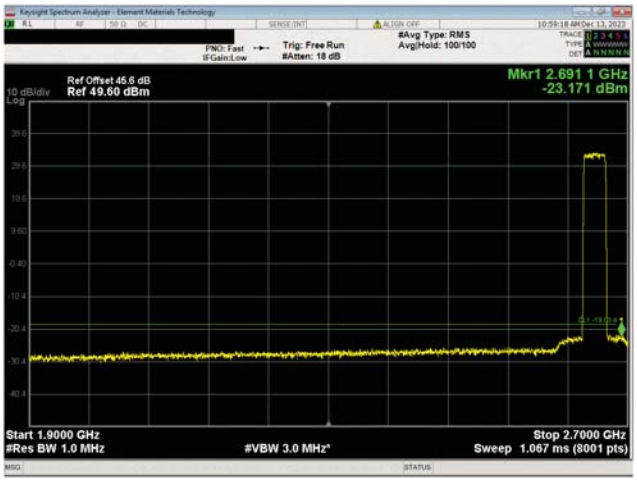
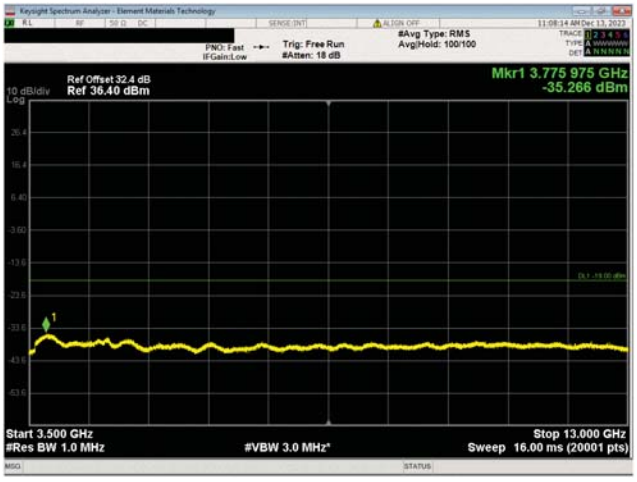


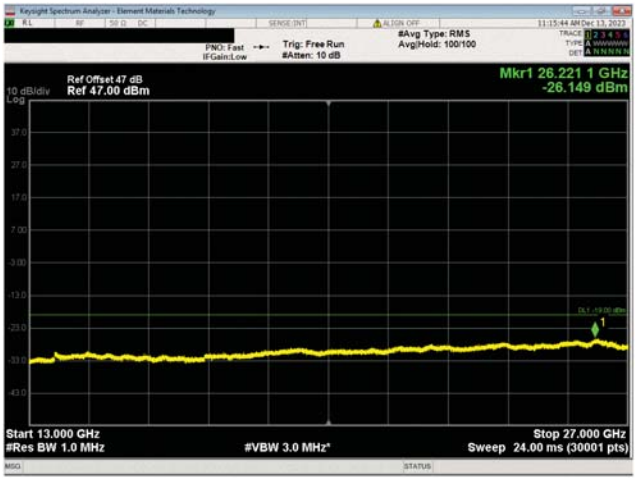
BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
30 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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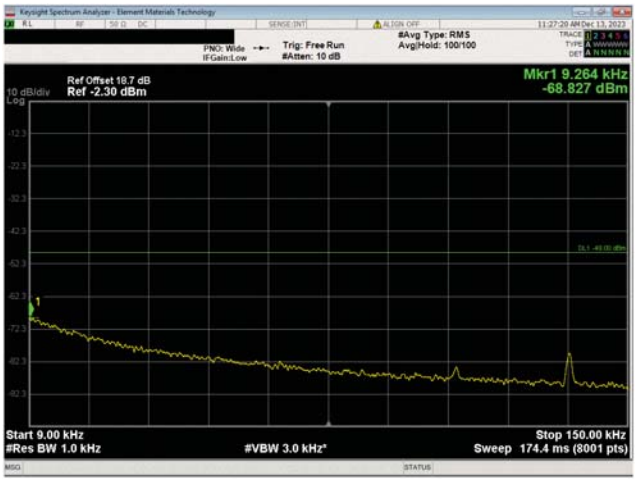
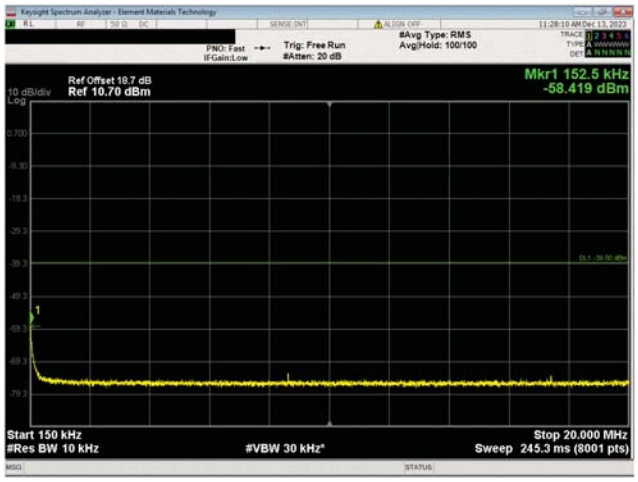
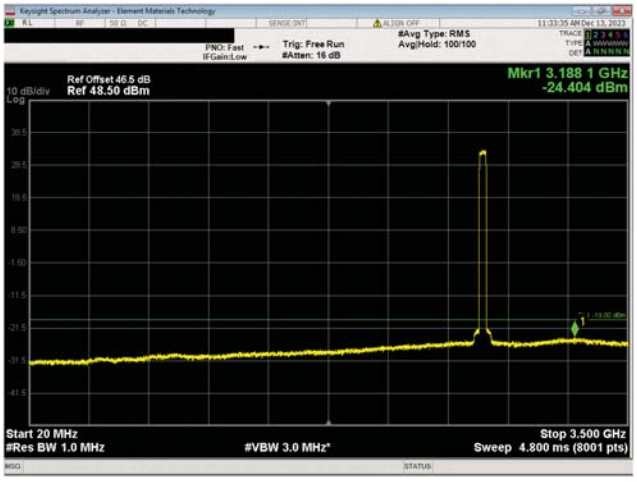


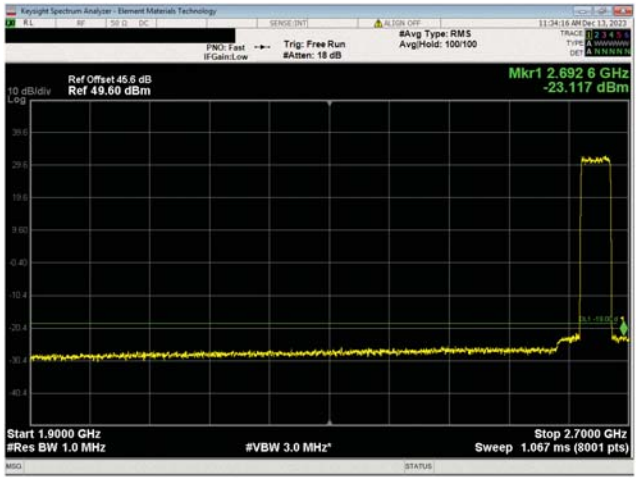
BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS

element
TbtTx 2023.12.05.0
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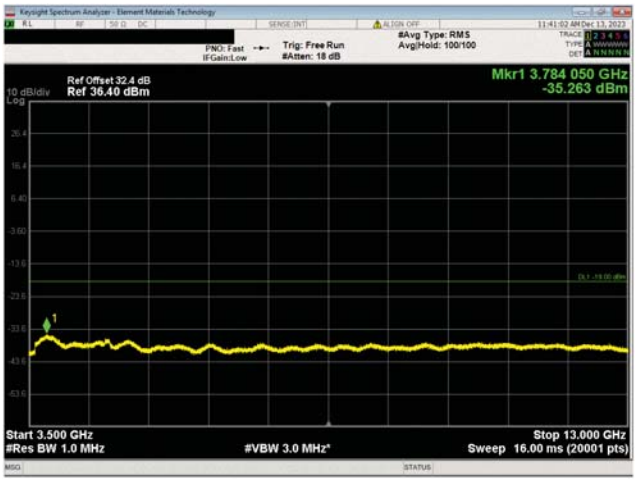
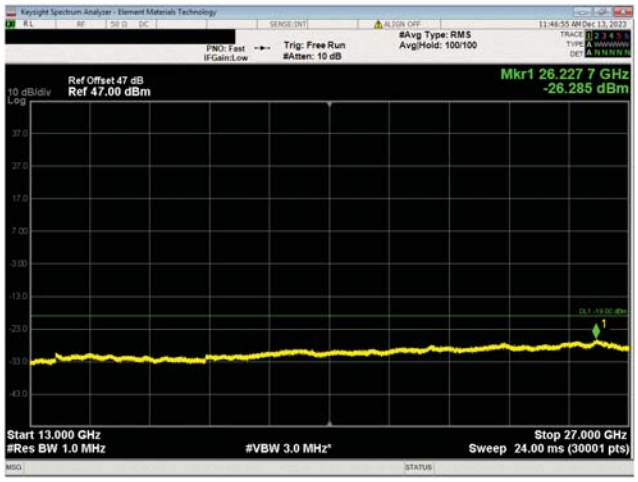


BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz



BRS Band n7, 2620 MHz - 2690 MHz
40 MHz Bandwidth
256QAM Modulation
Mid Ch, 2655.0 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

element
TbtTx 2023.12.05.0
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TEST DESCRIPTION

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 measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer.

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 approach were made 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 AHFIHA 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 24.238(a), RSS 133 6.5 (i), FCC 27.53(h)(1), RSS-139 5.6, FCC 27.53(m)(2), and RSS-199 5.6, the power of any emission outside of the authorized operating frequency range cannot exceed -13 dBm. The limit is adjusted to -19 dBm [-13 dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO transmitter.

The resolution bandwidth to be used for these measurements is per FCC 24.238(b), RSS 133 6.5 (i), FCC 27.53(h)(3), RSS-139 5.6, FCC 27.53(m)(6), and RSS-199 5.6. Compliance is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater.

The testing was performed using only one modulation type because the Occupied Bandwidth variation between modulation types is small, the average output power variation between modulation types is small, and there was small variation in measurements over modulation types from previous certification testing efforts. The QPSK modulation type was used. (See ANSI C63.26. clause 5.7.2e).

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 > 1MHz was used for all other frequency ranges.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFL	2023-03-17	2024-03-17
Block - DC	Fairview Microwave	SD3379	AMM	2023-08-04	2024-08-04
Block - DC	Fairview Microwave	SD3235-2148	ANF	2023-05-24	2024-05-24
Generator - Signal	Keysight	N5182B	TES	2021-09-14	2024-09-14

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

element
TbtTx 2023.12.05.0
WTD.2023.11.13.0

MULTICARRIER TEST CONFIGURATIONS

a) *PCS Multicarrier Multiband Test Case 1:* In the PCS band, three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band edge (1932.5 MHz and 1937.5 MHz) and a third carrier with maximum spacing between the other two carrier frequencies (1992.5 MHz) at the upper band edge. In the AWS and BRS bands, single NR10 and NR5 carriers at the middle channel (2155.0 MHz and 2655.0 MHz). The smallest channel bandwidth is selected to maximize carrier power spectral density. The carriers are operated at maximum power (~20W/PCS carrier, 60W/AWS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carriers + 60W for AWS band carrier + 40W for BRS band carrier).

b) *PCS Multicarrier Multiband Test Case 2:* In the PCS band, two NR30 carriers (with minimum spacing between carrier frequencies) at the lower band edge (1945.0 MHz and 1975.0 MHz). In the AWS and BRS bands, single NR40 carriers at the middle channel (2155.0 MHz and 2655.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers are operated at maximum power (~30W/PCS carrier, 60W/AWS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carriers + 60W for AWS band carrier + 40W for BRS band carrier).

c) *PCS Multicarrier Multiband Test Case 3:* In the PCS band, two NR30 carriers (with minimum spacing between carrier frequencies) at the upper band edge (1950.0 MHz and 1980.0 MHz). In the AWS and BRS bands, single NR40 carriers at the middle channel (2155.0 MHz and 2655.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers and operated at maximum power (~30W/PCS carrier, 60W/AWS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carriers + 60W for AWS band carrier + 40W for BRS band carrier).

d) *AWS Multicarrier Multiband Test Case 1*: In the AWS band, three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band edge (2112.5 MHz and 2117.5 MHz) and a third carrier with maximum spacing between the other two carrier frequencies (2197.5 MHz) at the upper band edge. In the PCS and BRS bands, single NR10 and NR5 carriers at the middle channel (1962.5 MHz and 2655.0 MHz). The smallest channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power (~20W/AWS carrier, 60W/PCS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for AWS band carriers + 40W for BRS band carrier)

e) *AWS Multicarrier Multiband Test Case 2:* In the AWS band, two NR40 carriers (with minimum spacing between carrier frequencies) at the lower band edge (2130.0 MHz and 2170.0 MHz). In the PCS and BRS bands, single NR40 carriers at the middle channel (1962.5 MHz and 2655.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers are operated at maximum power (~30W/AWS carrier, 60W/PCS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for AWS band carriers + 40W for BRS band carrier).

f) *AWS Multicarrier Multiband Test Case 3:* In the AWS band, two NR40 carriers (with minimum spacing between carrier frequencies) at the upper band edge (2140.0 MHz and 2180.0 MHz). In the PCS and BRS bands, single NR40 carriers at the middle channel (1962.5 MHz and 2655.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers are operated at maximum power (~30W/AWS carrier, 60W/PCS carrier and 40W/BRS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for AWS band carriers + 40W for BRS band carrier).

g) *BRS Multicarrier Multiband Test Case 1*: In the BRS band, three NR5 carriers using two carriers (with minimum spacing between carrier frequencies) at the lower band edge (2622.5 MHz and 2627.5 MHz) and a third carrier with maximum spacing between the other two carrier frequencies (2687.5 MHz) at the upper band edge. In the PCS and AWS bands, single NR10 and NR5 carriers at the middle channel (1962.5 MHz and 2155.0 MHz). The smallest channel bandwidth was selected to maximize carrier power spectral density. The carriers are operated at maximum power (~20W/BRS carrier, 60W/PCS carrier, and 40W/AWS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for BRS band carriers + 40W for AWS band carrier)

h) *BRS Multicarrier Multiband Test Case 2:* In the BRS band, two NR30 carriers (with minimum spacing between carrier frequencies) at the lower band edge (2635.0 MHz and 2665.0 MHz). In the PCS and AWS bands, single NR40 carriers at the middle channel (1962.5 MHz and 2155.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers are operated at maximum power (~30W/BRS carrier, 60W/PCS carrier and

40W/AWS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for BRS band carriers + 40W for AWS band carrier).

i) *BRS Multicarrier Multiband Test Case 3:* In the BRS band, two NR30 carriers (with minimum spacing between carrier frequencies) at the upper band edge (2645.0 MHz and 2675.0 MHz). In the PCS and AWS bands, single NR40 carriers at the middle channel (1962.5 MHz and 2155.0 MHz). The largest channel bandwidth is selected to maximize carrier OBW. The carriers are operated at maximum power (~30W/BRS carrier, 60W/PCS carrier and 40W/AWS carrier) with a total port power of 160 watts (60W for PCS band carrier + 60W for BRS band carriers + 40W for AWS band carrier).

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

element
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WTD.2023.11.13.0

EUT:	AirScale Base Transceiver Station Remote Radio Head Model AHFIHA	Work Order:	NOKI0072
Serial Number:	RW233800370	Date:	2024-01-25
Customer:	Nokia Solutions and Networks	Temperature:	21.9°C
Attendees:	John Rattanavong, Mitch Hill	Relative Humidity:	33%
Customer Project:	None	Bar. Pressure (PMSL):	1026 mbar
Tested By:	Jarrod Brenden	Job Site:	TX07
Power:	54VDC	Configuration:	NOKI0072-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 24E:2024	ANSI C63.26:2015
FCC 27:2024	ANSI C63.26:2015
RSS-133 Issue 6:2013 +A1:2018	ANSI C63.26:2015
RSS-199 Issue 4:2023	ANSI C63.26:2015
RSS139 Issue 4:2022	ANSI C63.26:2015

COMMENTS

Losses in the measurement path were accounted for: DC Block, attenuators, cables, and filters where used.

DEVIATIONS FROM TEST STANDARD

None

CONCLUSION

Pass

Tested By

TEST RESULTS

	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
Port 1					
PCS Multicarrier Multiband Test Case 1					
Configuration A	9 kHz - 150 kHz	0.01	-68.7	-49	Pass
	150 kHz - 20 MHz	0.15	-58.92	-39	Pass
	20 MHz - 3.5 GHz	3186.37	-24.47	-19	Pass
	1.9 GHz - 2.7 GHz	2499.5	-25.11	-19	Pass
	3.5 GHz - 13 GHz	3802.58	-35.05	-19	Pass
	13 GHz - 27 GHz	26239.33	-25.97	-19	Pass
PCS Multicarrier Multiband Test Case 2					
Configuration B	9 kHz - 150 kHz	0.01	-68.18	-49	Pass
	150 kHz - 20 MHz	0.15	-58.74	-39	Pass
	20 MHz - 3.5 GHz	3147.22	-24.94	-19	Pass
	1.9 GHz - 2.7 GHz	2527	-25.17	-19	Pass
	3.5 GHz - 13 GHz	3768.85	-35.34	-19	Pass
	13 GHz - 27 GHz	26245.4	-26.2	-19	Pass
PCS Multicarrier Multiband Test Case 3					
Configuration C	9 kHz - 150 kHz	0.01	-68.61	-49	Pass
	150 kHz - 20 MHz	0.15	-58.01	-39	Pass
	20 MHz - 3.5 GHz	3201.16	-24.64	-19	Pass
	1.9 GHz - 2.7 GHz	2409.8	-25.53	-19	Pass
	3.5 GHz - 13 GHz	3776.45	-35.22	-19	Pass
	13 GHz - 27 GHz	26265.93	-26.11	-19	Pass

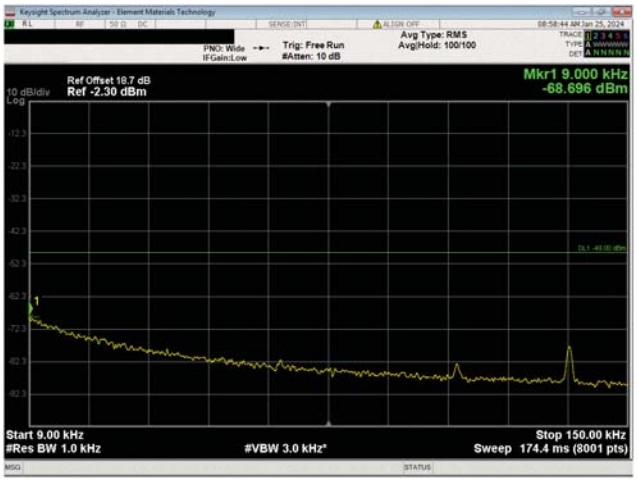
SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

element
TbtTx 2023.12.05.0
WTD.2023.11.13.0

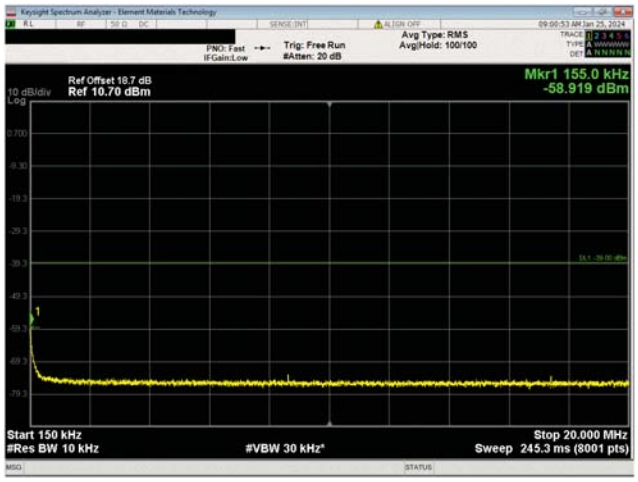
	Frequency Range	Measured Freq (MHz)	Max Value (dBm)	Limit (dBm)	Result
AWS Multicarrier Multiband Test Case 1					
Configuration D	9 kHz - 150 kHz	0.01	-68.63	-49	Pass
	150 kHz - 20 MHz	0.16	-59.79	-39	Pass
	20 MHz - 3.5 GHz	3096.32	-24.57	-19	Pass
	1.9 GHz - 2.7 GHz	2563.5	-25.12	-19	Pass
	3.5 GHz - 13 GHz	3790.23	-35.42	-19	Pass
	13 GHz - 27 GHz	26337.8	-26.12	-19	Pass
AWS Multicarrier Multiband Test Case 2					
Configuration E	9 kHz - 150 kHz	0.01	-68.97	-49	Pass
	150 kHz - 20 MHz	0.15	-58.76	-39	Pass
	20 MHz - 3.5 GHz	3172.01	-25.26	-19	Pass
	1.9 GHz - 2.7 GHz	2503.7	-25.39	-19	Pass
	3.5 GHz - 13 GHz	3807.8	-35.32	-19	Pass
	13 GHz - 27 GHz	26250.07	-26.36	-19	Pass
AWS Multicarrier Multiband Test Case 3					
Configuration F	9 kHz - 150 kHz	0.01	-69.39	-49	Pass
	150 kHz - 20 MHz	0.15	-58.87	-39	Pass
	20 MHz - 3.5 GHz	3189.85	-24.76	-19	Pass
	1.9 GHz - 2.7 GHz	2520.6	-25.58	-19	Pass
	3.5 GHz - 13 GHz	3794.98	-35.34	-19	Pass
	13 GHz - 27 GHz	26227.67	-26.03	-19	Pass
BRS Multicarrier Multiband Test Case 1					
Configuration G	9 kHz - 150 kHz	0.01	-68.9	-49	Pass
	150 kHz - 20 MHz	0.16	-59.27	-39	Pass
	20 MHz - 3.5 GHz	3182.89	-24.97	-19	Pass
	1.9 GHz - 2.7 GHz	2504.5	-25.48	-19	Pass
	3.5 GHz - 13 GHz	3753.65	-35.4	-19	Pass
	13 GHz - 27 GHz	26263.13	-25.97	-19	Pass
BRS Multicarrier Multiband Test Case 2					
Configuration H	9 kHz - 150 kHz	0.01	-68.81	-49	Pass
	150 kHz - 20 MHz	0.15	-58.62	-39	Pass
	20 MHz - 3.5 GHz	3208.55	-24.75	-19	Pass
	1.9 GHz - 2.7 GHz	2451.8	-25.61	-19	Pass
	3.5 GHz - 13 GHz	3779.78	-35.28	-19	Pass
	13 GHz - 27 GHz	26260.33	-26.06	-19	Pass
BRS Multicarrier Multiband Test Case 3					
Configuration I	9 kHz - 150 kHz	0.01	-68.97	-49	Pass
	150 kHz - 20 MHz	0.15	-59.4	-39	Pass
	20 MHz - 3.5 GHz	3201.59	-25.06	-19	Pass
	1.9 GHz - 2.7 GHz	2532	-26.46	-19	Pass
	3.5 GHz - 13 GHz	3784.05	-35.09	-19	Pass
	13 GHz - 27 GHz	26263.6	-26.02	-19	Pass

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

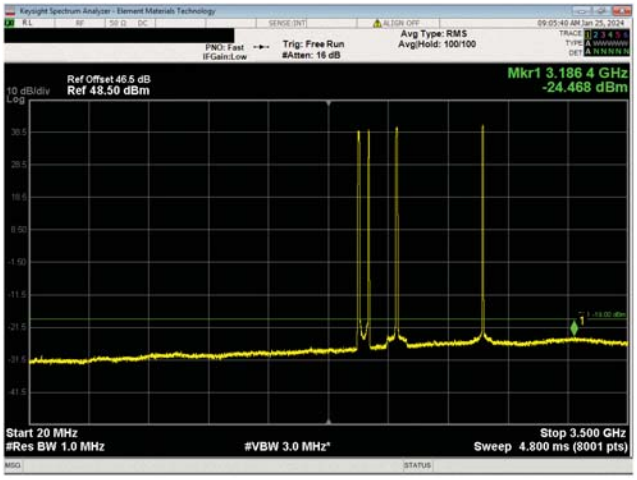
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



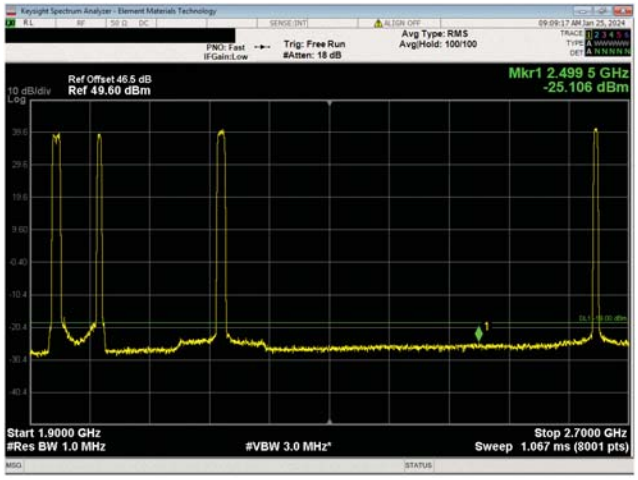
PCS Multicarrier Multiband Test Case 1
QPSK Modulation
9 kHz - 150 kHz



PCS Multicarrier Multiband Test Case 1
QPSK Modulation
150 kHz - 20 MHz



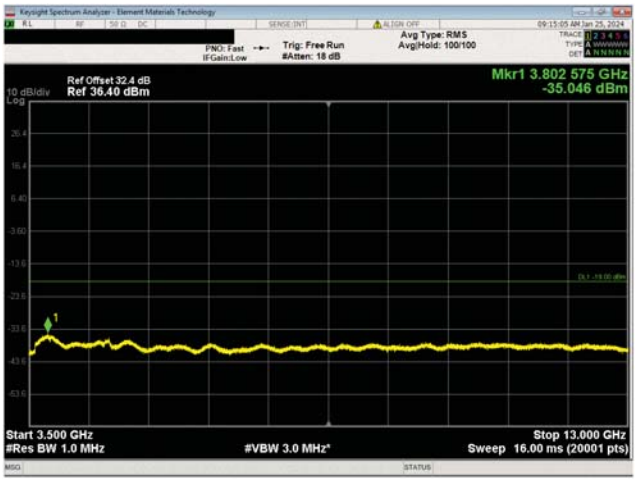
PCS Multicarrier Multiband Test Case 1
QPSK Modulation
20 MHz - 3.5 GHz



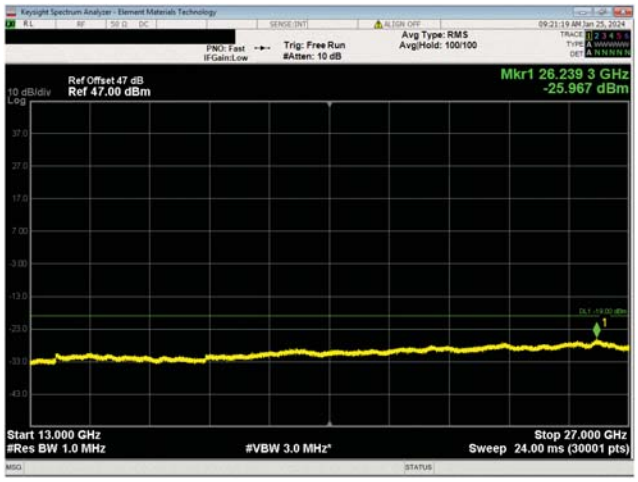
PCS Multicarrier Multiband Test Case 1
QPSK Modulation
1.9 GHz - 2.7 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

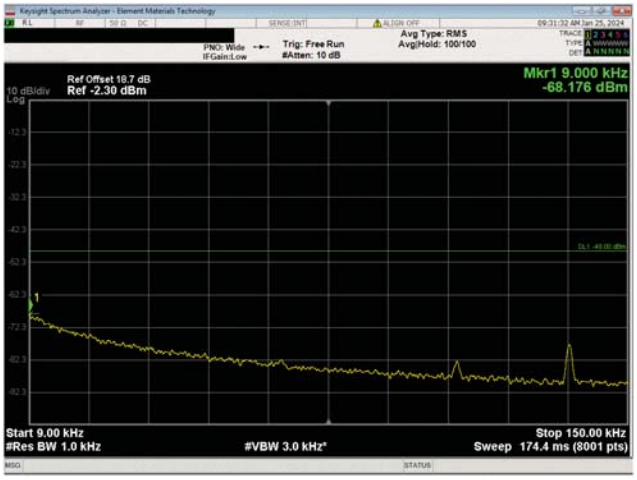
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



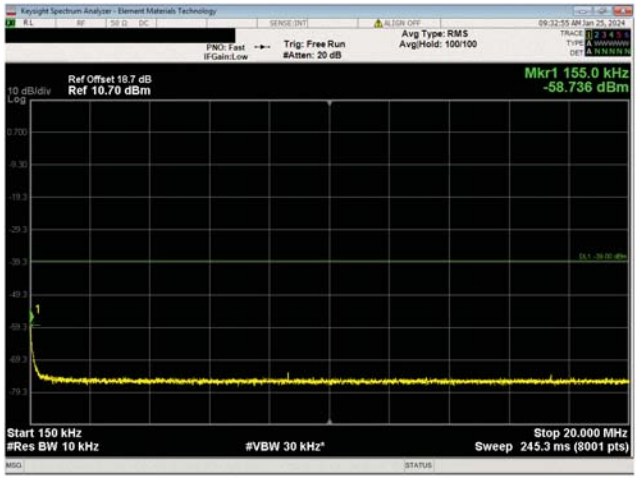
PCS Multicarrier Multiband Test Case 1
QPSK Modulation
3.5 GHz - 13 GHz



PCS Multicarrier Multiband Test Case 1
QPSK Modulation
13 GHz - 27 GHz



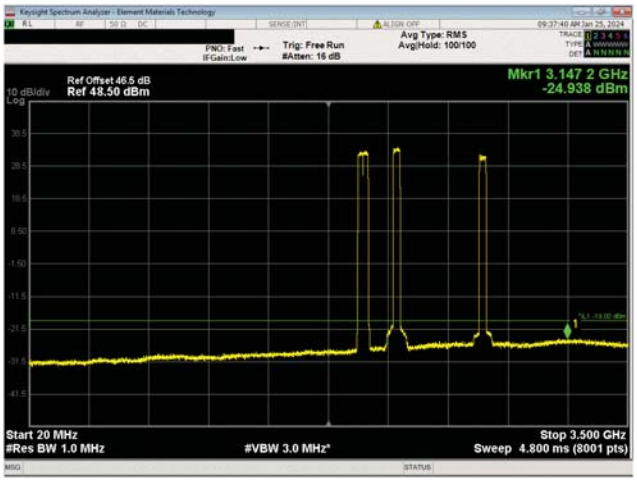
PCS Multicarrier Multiband Test Case 2
QPSK Modulation
9 kHz - 150 kHz



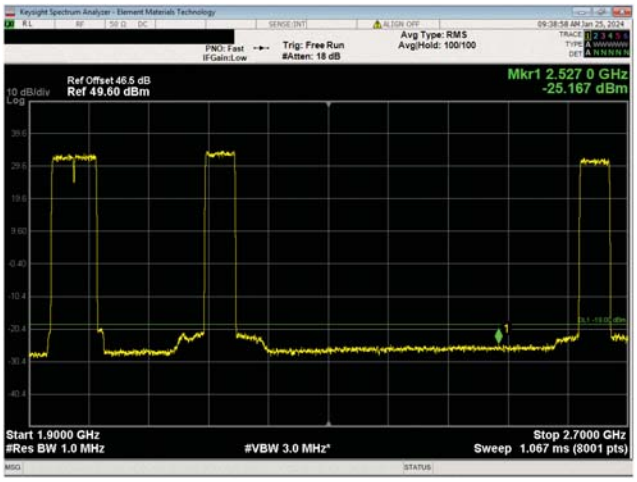
PCS Multicarrier Multiband Test Case 2
QPSK Modulation
150 kHz - 20 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

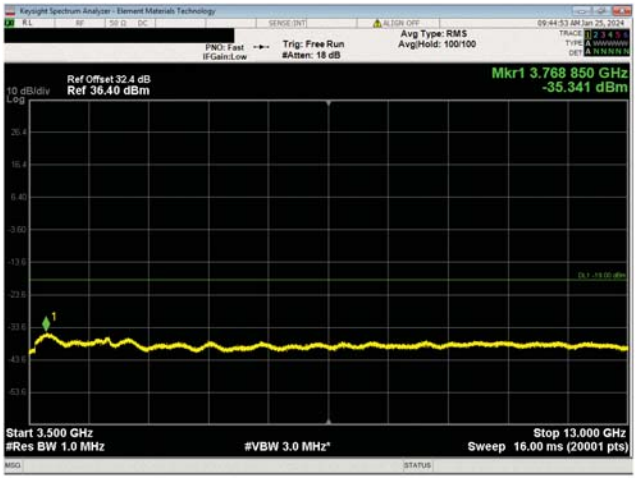
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



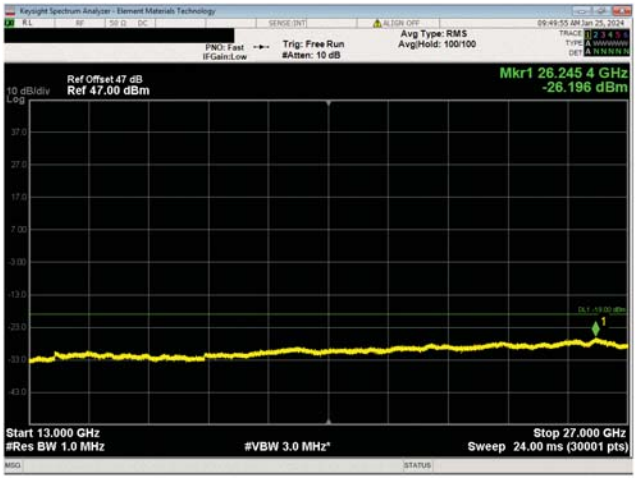
PCS Multicarrier Multiband Test Case 2
QPSK Modulation
20 MHz - 3.5 GHz



PCS Multicarrier Multiband Test Case 2
QPSK Modulation
1.9 GHz - 2.7 GHz



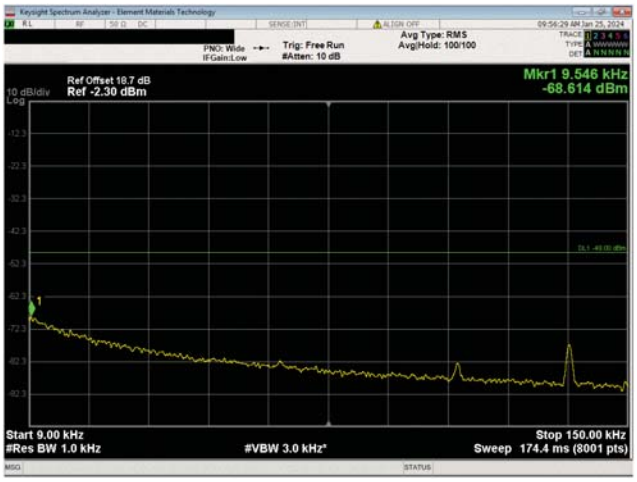
PCS Multicarrier Multiband Test Case 2
QPSK Modulation
3.5 GHz - 13 GHz



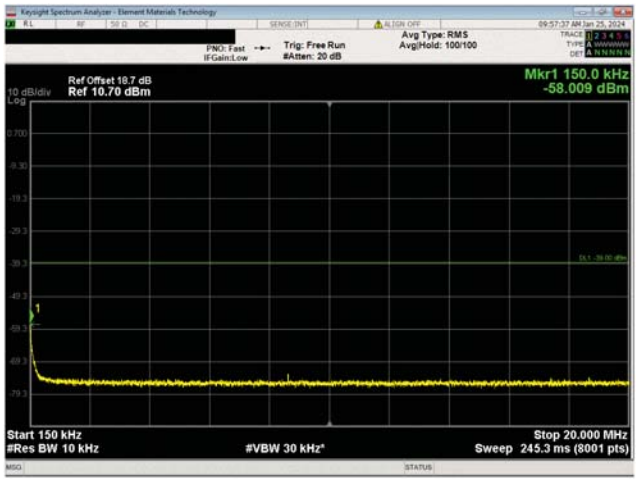
PCS Multicarrier Multiband Test Case 2
QPSK Modulation
13 GHz - 27 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

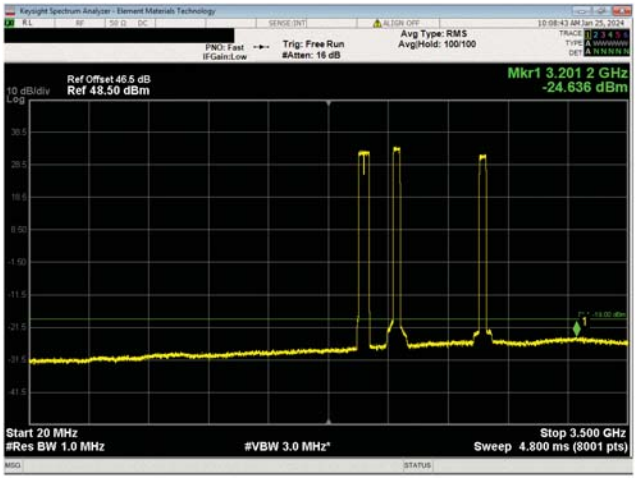
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



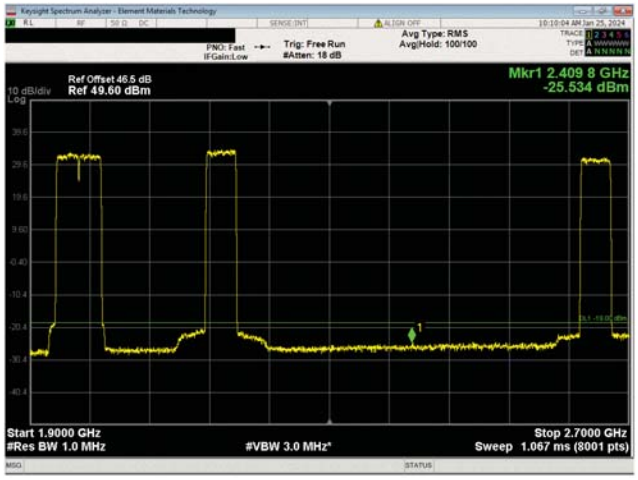
PCS Multicarrier Multiband Test Case 3
QPSK Modulation
9 kHz - 150 kHz



PCS Multicarrier Multiband Test Case 3
QPSK Modulation
150 kHz - 20 MHz



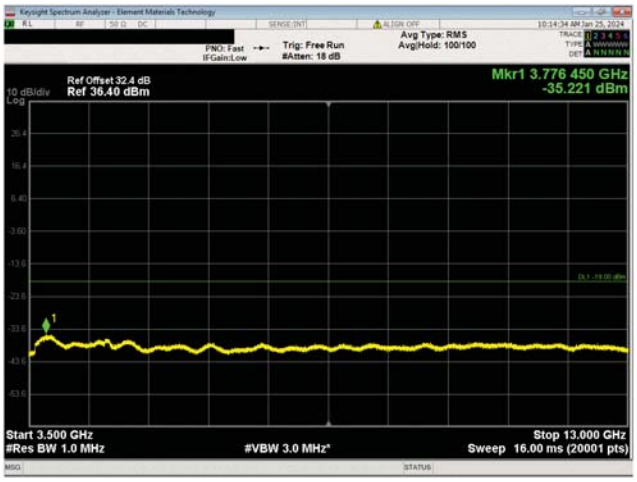
PCS Multicarrier Multiband Test Case 3
QPSK Modulation
20 MHz - 3.5 GHz



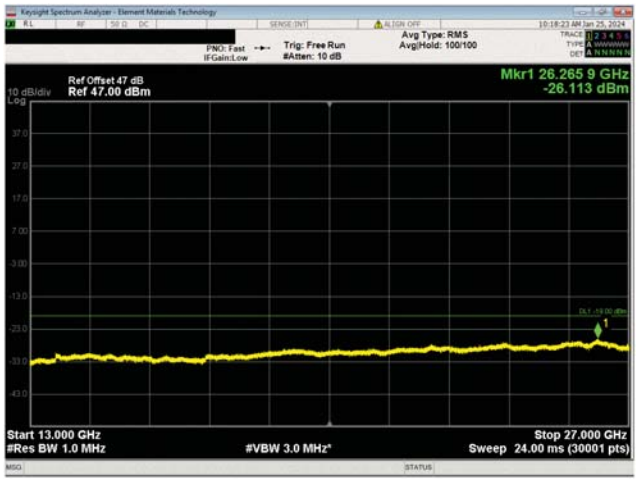
PCS Multicarrier Multiband Test Case 3
QPSK Modulation
1.9 GHz - 2.7 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

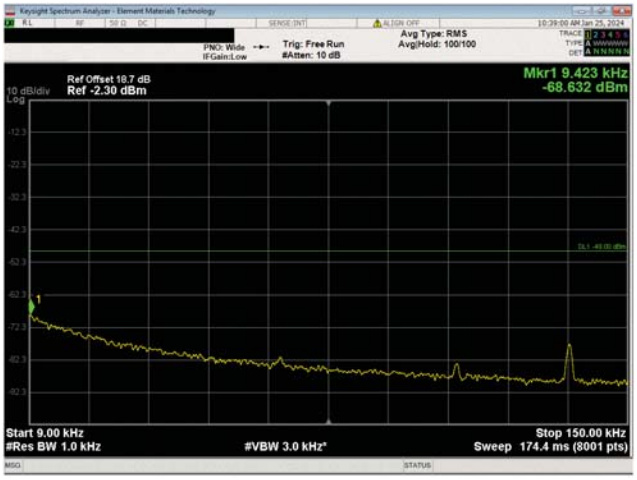
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



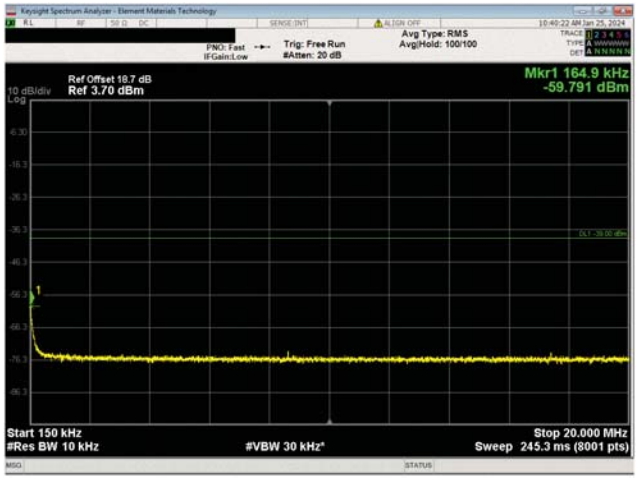
PCS Multicarrier Multiband Test Case 3
QPSK Modulation
3.5 GHz - 13 GHz



PCS Multicarrier Multiband Test Case 3
QPSK Modulation
13 GHz - 27 GHz



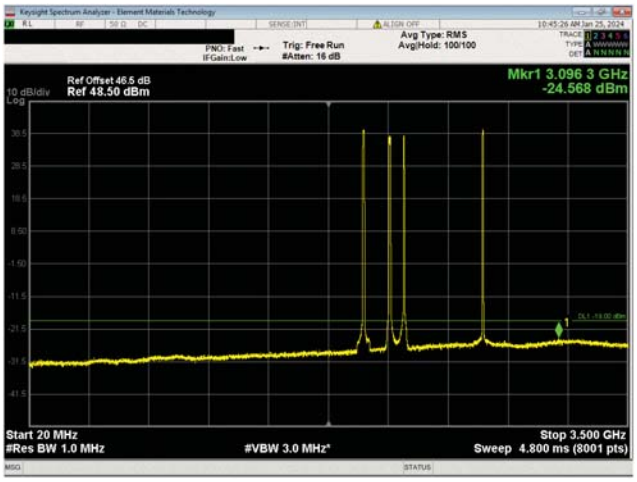
AWS Multicarrier Multiband Test Case 1
QPSK Modulation
9 kHz - 150 kHz



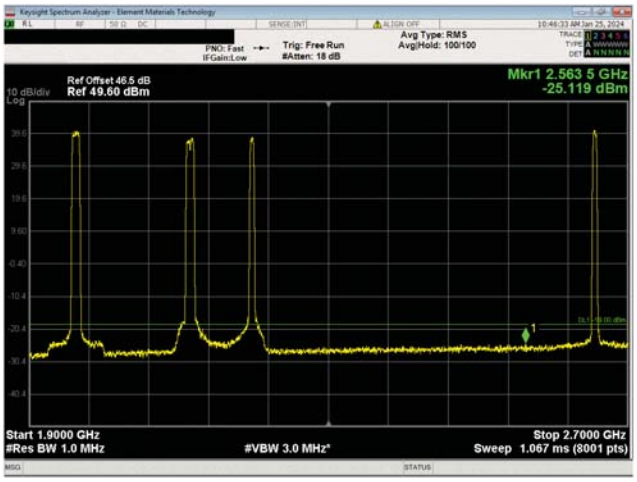
AWS Multicarrier Multiband Test Case 1
QPSK Modulation
150 kHz - 20 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

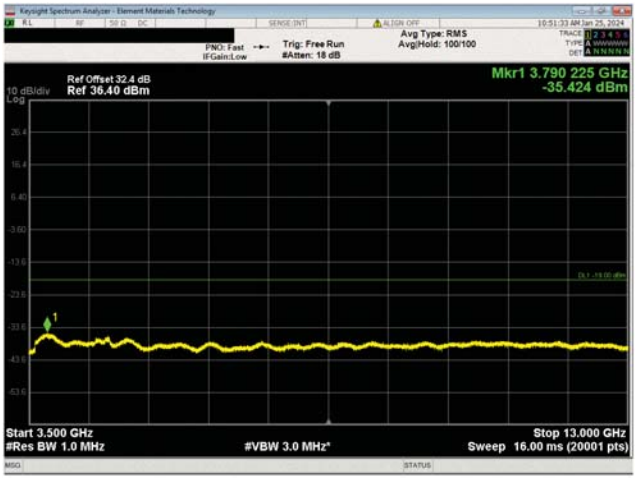
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



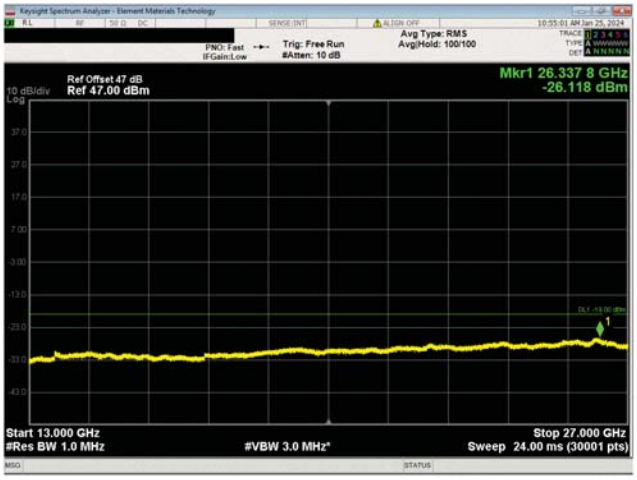
AWS Multicarrier Multiband Test Case 1
QPSK Modulation
20 MHz - 3.5 GHz



AWS Multicarrier Multiband Test Case 1
QPSK Modulation
1.9 GHz - 2.7 GHz



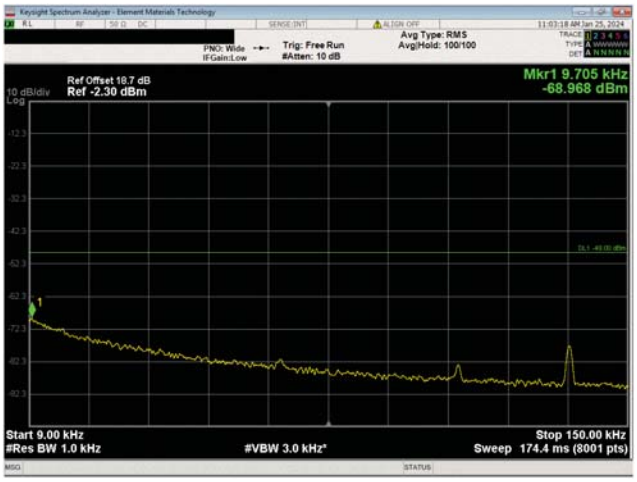
AWS Multicarrier Multiband Test Case 1
QPSK Modulation
3.5 GHz - 13 GHz



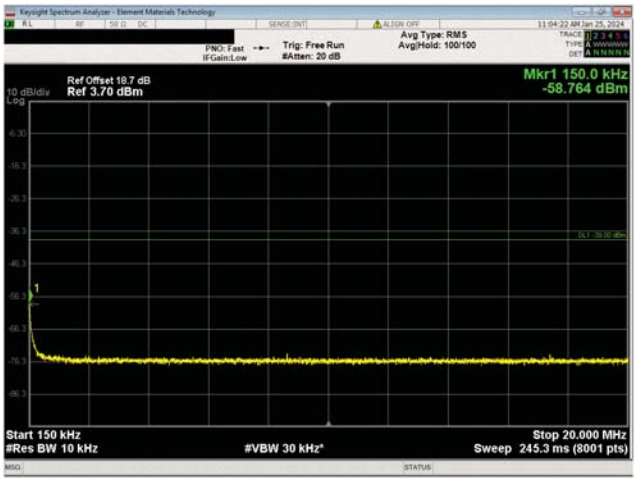
AWS Multicarrier Multiband Test Case 1
QPSK Modulation
13 GHz - 27 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

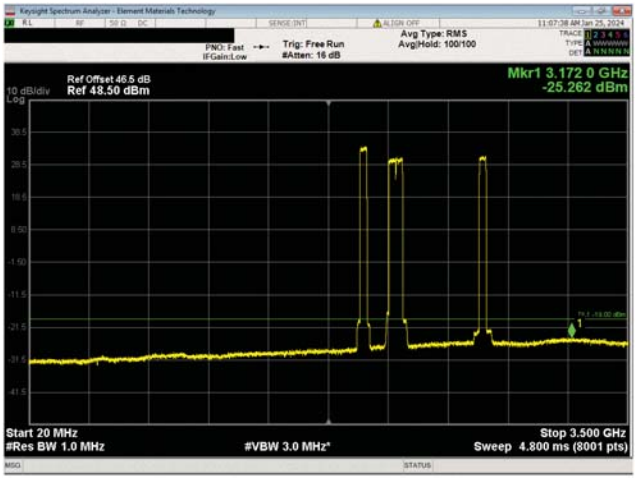
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



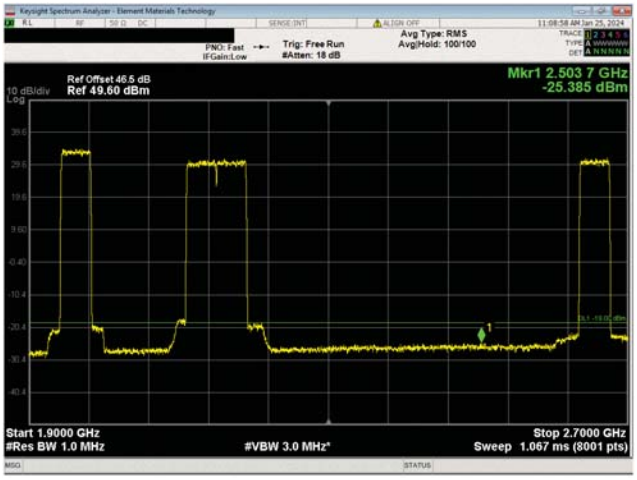
AWS Multicarrier Multiband Test Case 2
QPSK Modulation
9 kHz - 150 kHz



AWS Multicarrier Multiband Test Case 2
QPSK Modulation
150 kHz - 20 MHz



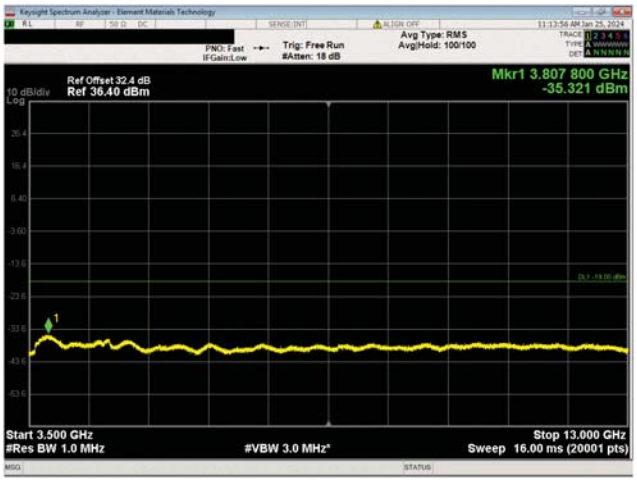
AWS Multicarrier Multiband Test Case 2
QPSK Modulation
20 MHz - 3.5 GHz



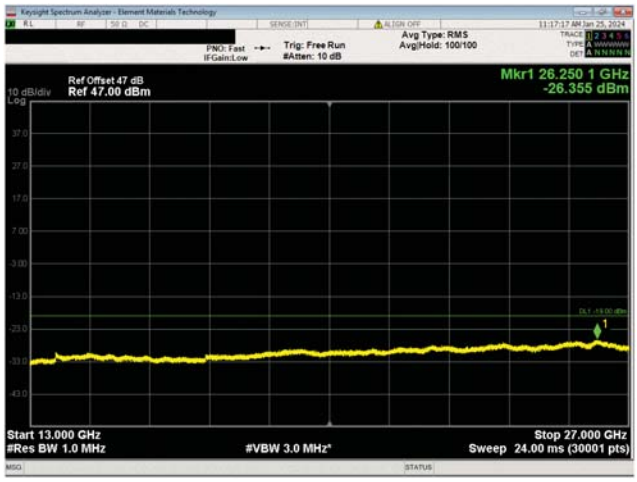
AWS Multicarrier Multiband Test Case 2
QPSK Modulation
1.9 GHz - 2.7 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

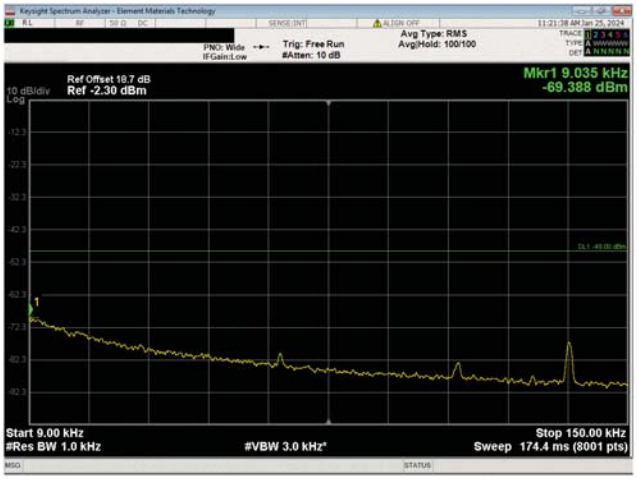
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



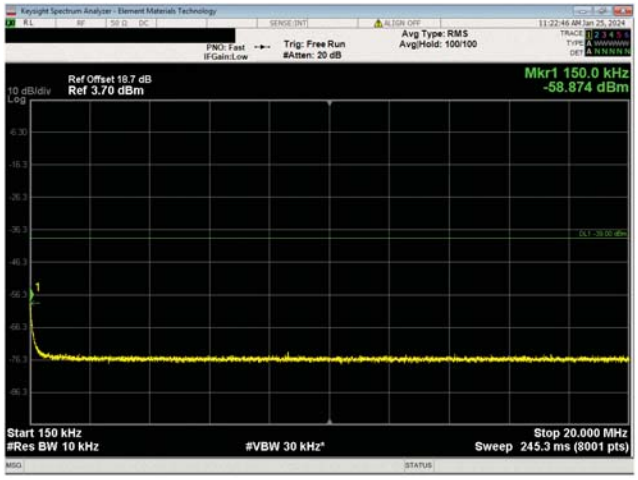
AWS Multicarrier Multiband Test Case 2
QPSK Modulation
3.5 GHz - 13 GHz



AWS Multicarrier Multiband Test Case 2
QPSK Modulation
13 GHz - 27 GHz



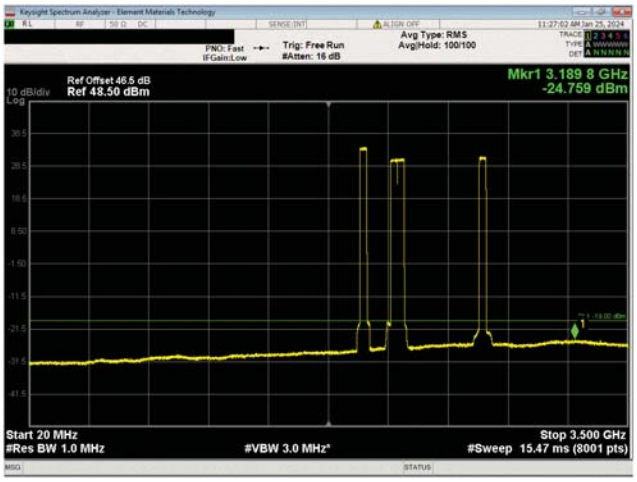
AWS Multicarrier Multiband Test Case 3
QPSK Modulation
9 kHz - 150 kHz



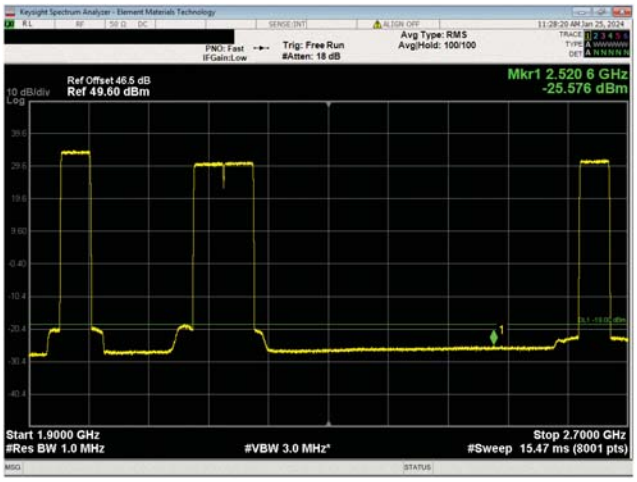
AWS Multicarrier Multiband Test Case 3
QPSK Modulation
150 kHz - 20 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

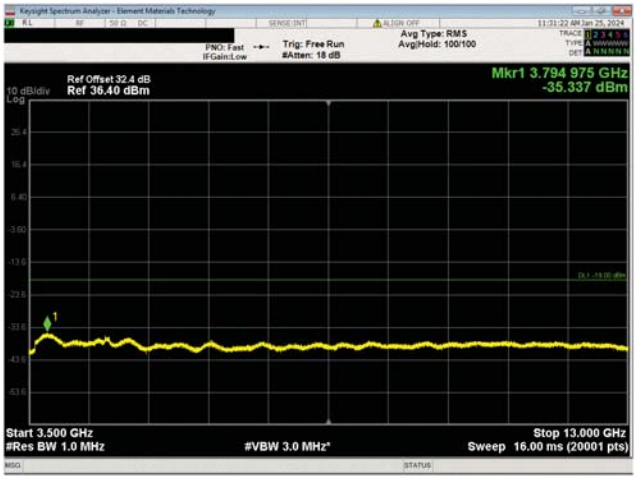
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



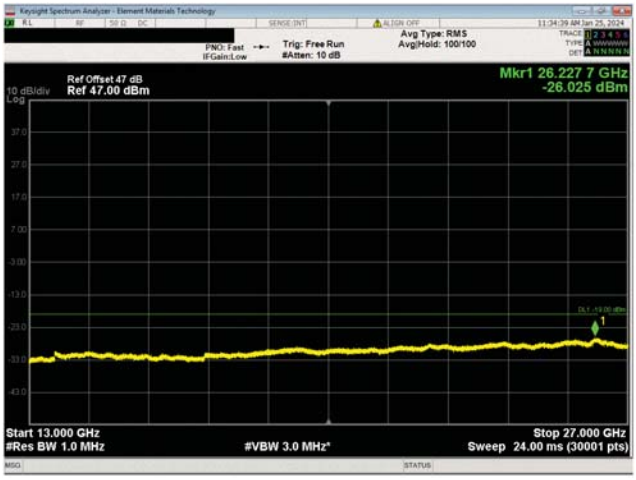
AWS Multicarrier Multiband Test Case 3
QPSK Modulation
20 MHz - 3.5 GHz



AWS Multicarrier Multiband Test Case 3
QPSK Modulation
1.9 GHz - 2.7 GHz



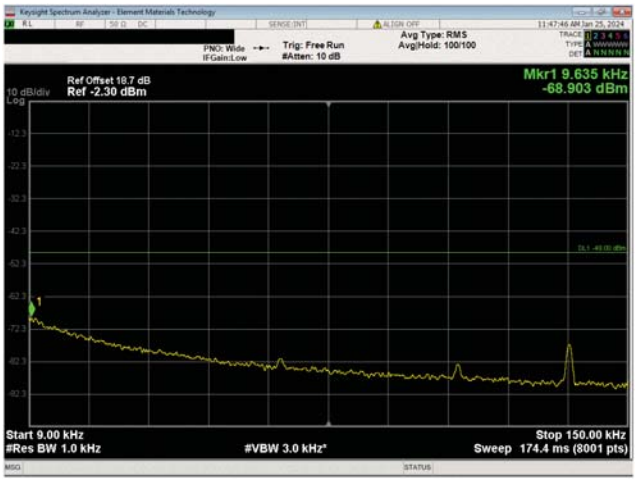
AWS Multicarrier Multiband Test Case 3
QPSK Modulation
3.5 GHz - 13 GHz



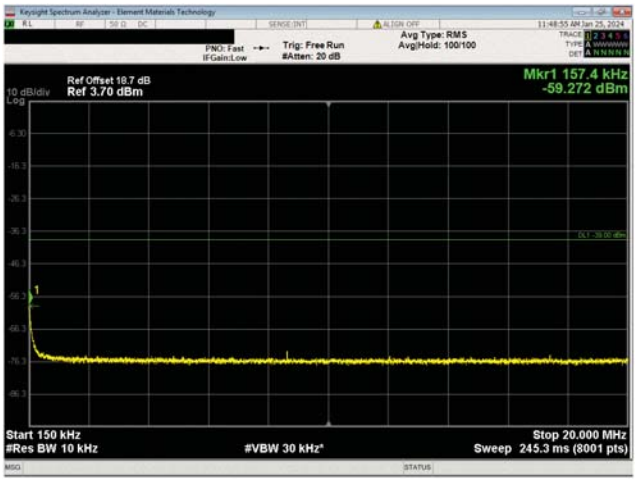
AWS Multicarrier Multiband Test Case 3
QPSK Modulation
13 GHz - 27 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

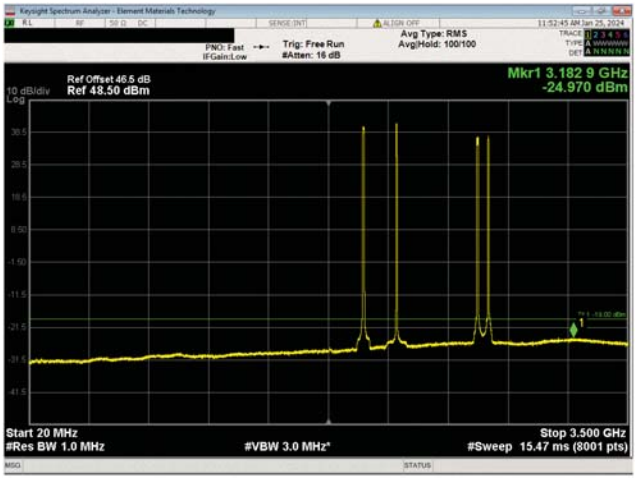
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



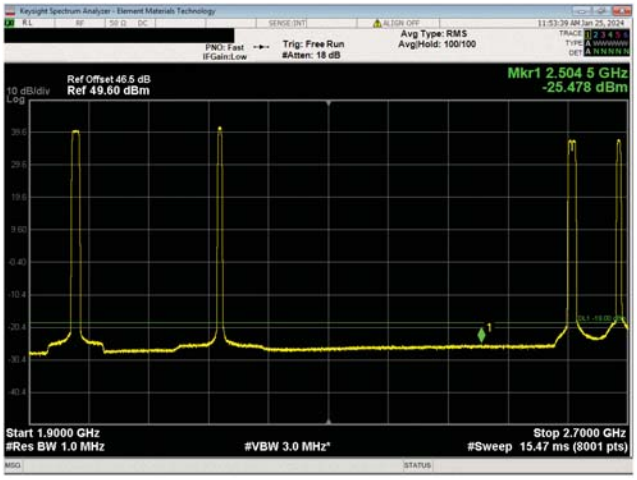
BRS Multicarrier Multiband Test Case 1
QPSK Modulation
9 kHz - 150 kHz



BRS Multicarrier Multiband Test Case 1
QPSK Modulation
150 kHz - 20 MHz



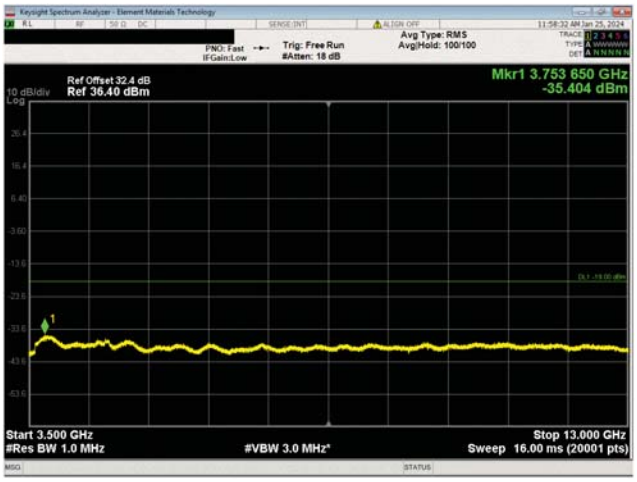
BRS Multicarrier Multiband Test Case 1
QPSK Modulation
20 MHz - 3.5 GHz



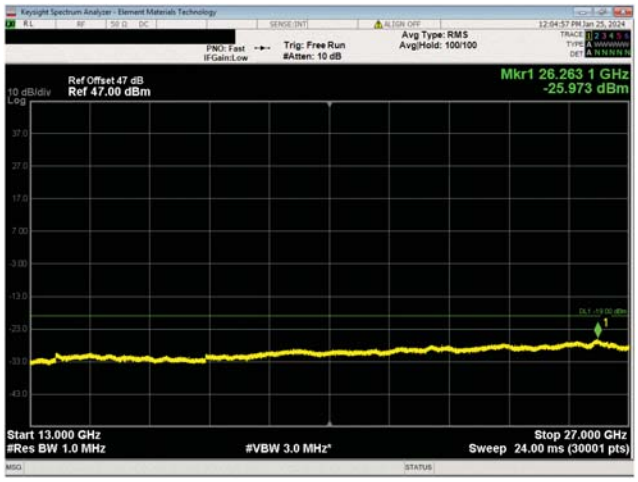
BRS Multicarrier Multiband Test Case 1
QPSK Modulation
1.9 GHz - 2.7 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

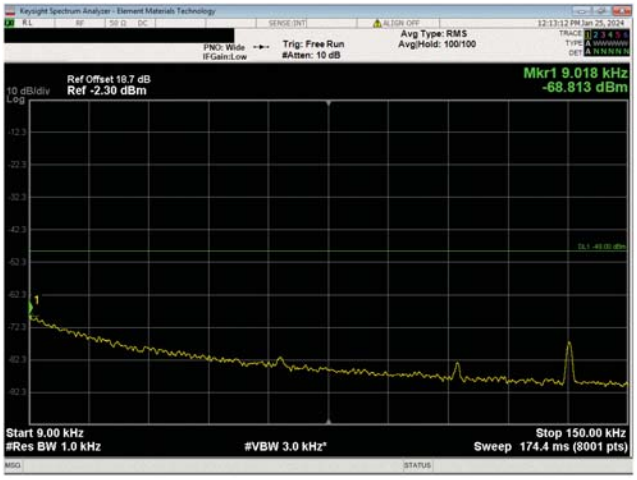
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



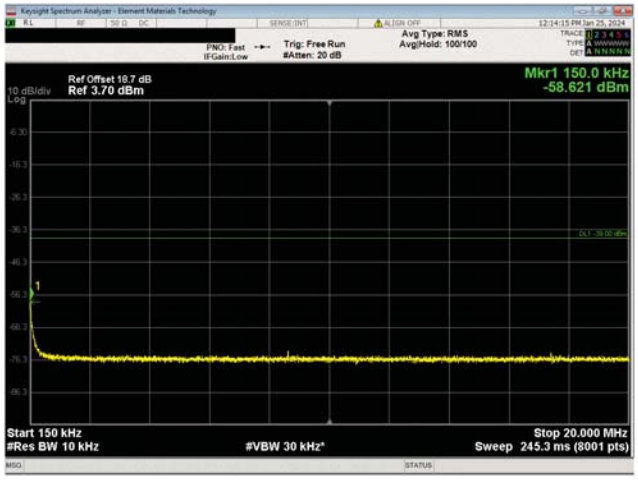
BRS Multicarrier Multiband Test Case 1
QPSK Modulation
3.5 GHz - 13 GHz



BRS Multicarrier Multiband Test Case 1
QPSK Modulation
13 GHz - 27 GHz



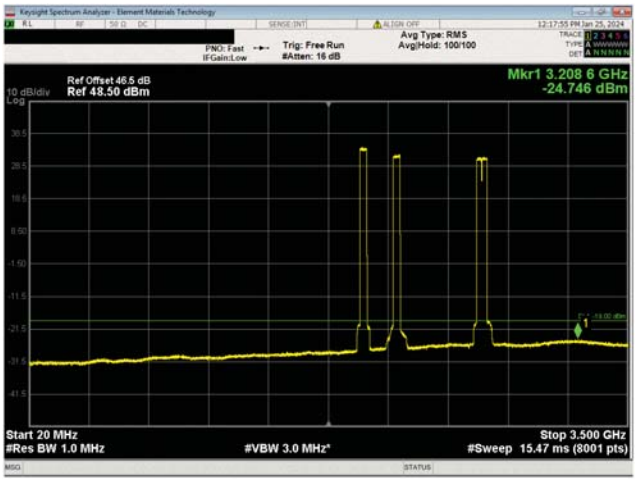
BRS Multicarrier Multiband Test Case 2
QPSK Modulation
9 kHz - 150 kHz



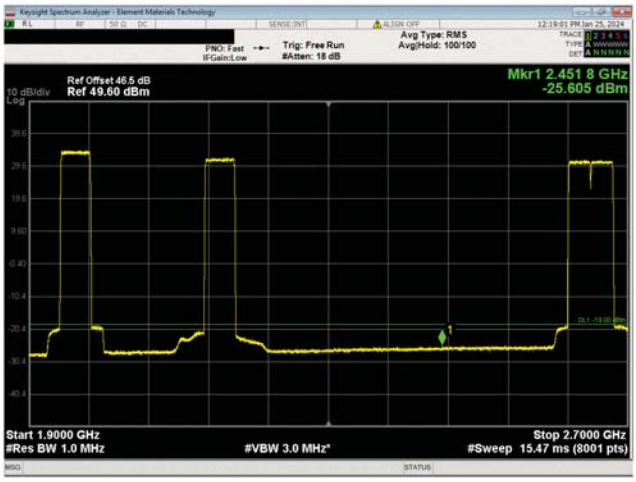
BRS Multicarrier Multiband Test Case 2
QPSK Modulation
150 kHz - 20 MHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

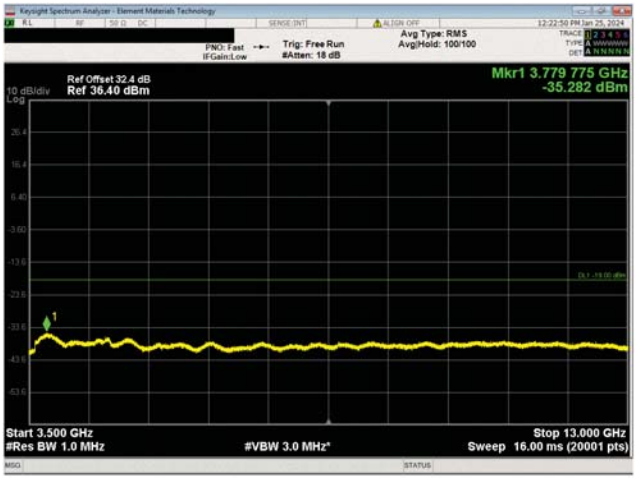
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



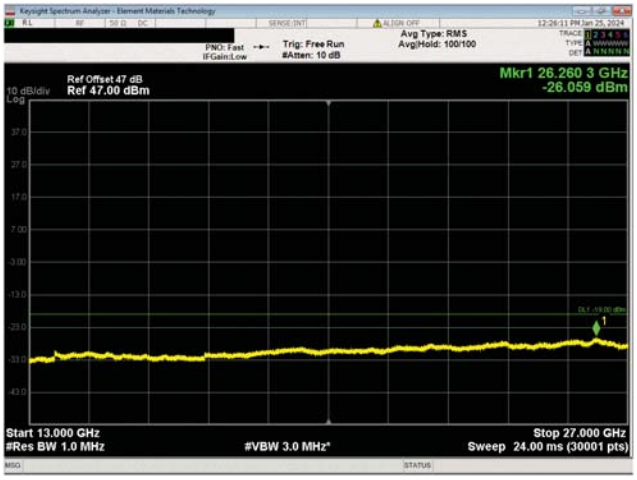
BRS Multicarrier Multiband Test Case 2
QPSK Modulation
20 MHz - 3.5 GHz



BRS Multicarrier Multiband Test Case 2
QPSK Modulation
1.9 GHz - 2.7 GHz



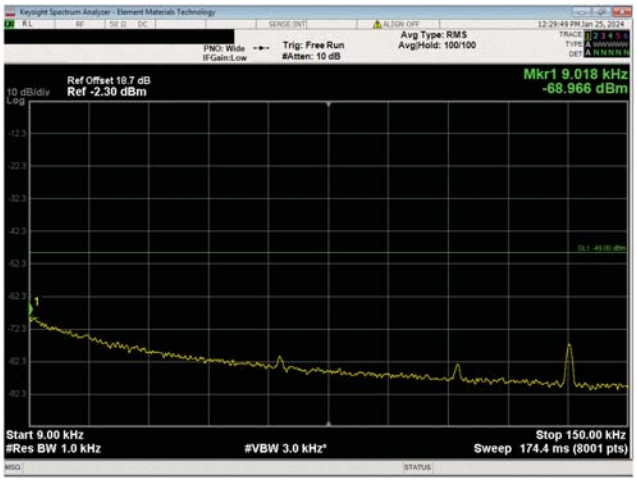
BRS Multicarrier Multiband Test Case 2
QPSK Modulation
3.5 GHz - 13 GHz



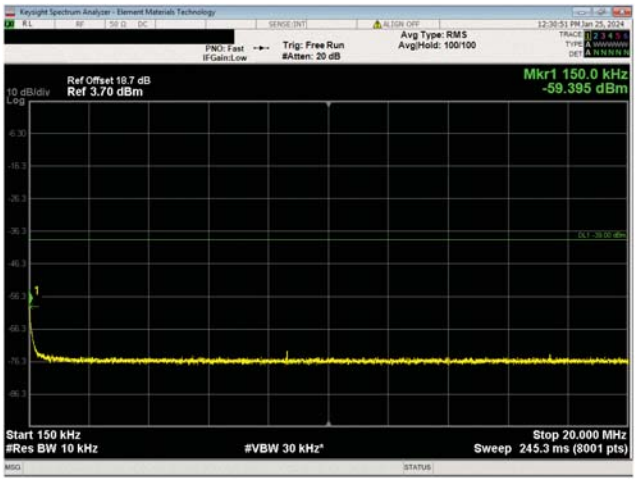
BRS Multicarrier Multiband Test Case 2
QPSK Modulation
13 GHz - 27 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

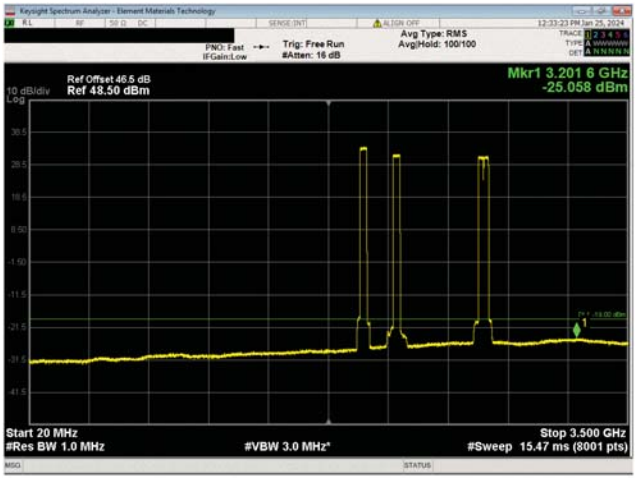
element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



BRS Multicarrier Multiband Test Case 3
QPSK Modulation
9 kHz - 150 kHz



BRS Multicarrier Multiband Test Case 3
QPSK Modulation
150 kHz - 20 MHz

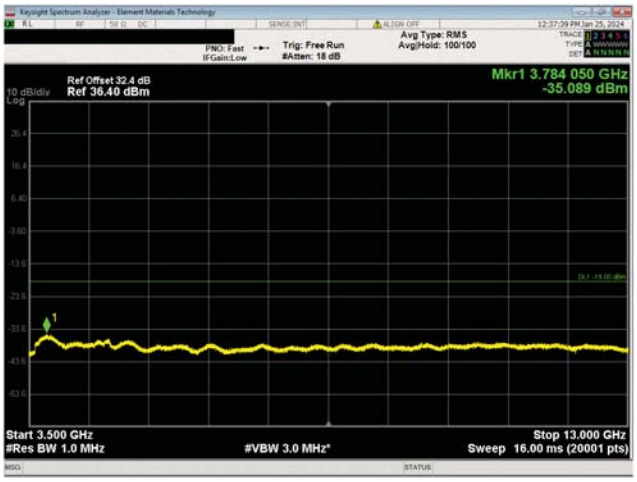


BRS Multicarrier Multiband Test Case 3
QPSK Modulation
20 MHz - 3.5 GHz

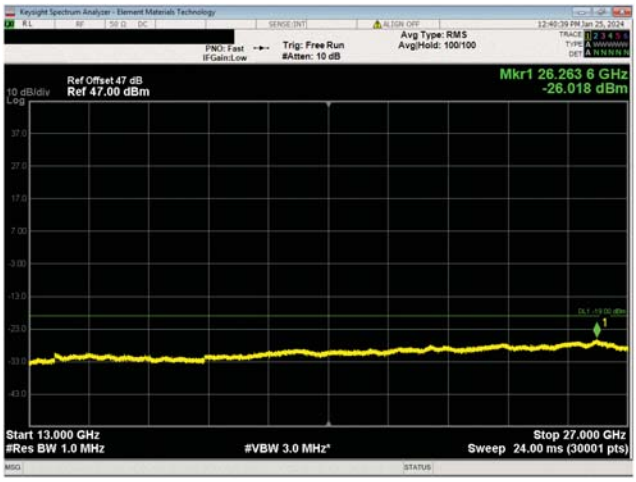
BRS Multicarrier Multiband Test Case 3
QPSK Modulation
1.9 GHz - 2.7 GHz

SPURIOUS CONDUCTED EMISSIONS - MULTICARRIER

element
TbtTx 2023.12.05.0
WTD.2023.11.13.0



BRS Multicarrier Multiband Test Case 3
QPSK Modulation
3.5 GHz - 13 GHz



BRS Multicarrier Multiband Test Case 3
QPSK Modulation
13 GHz - 27 GHz