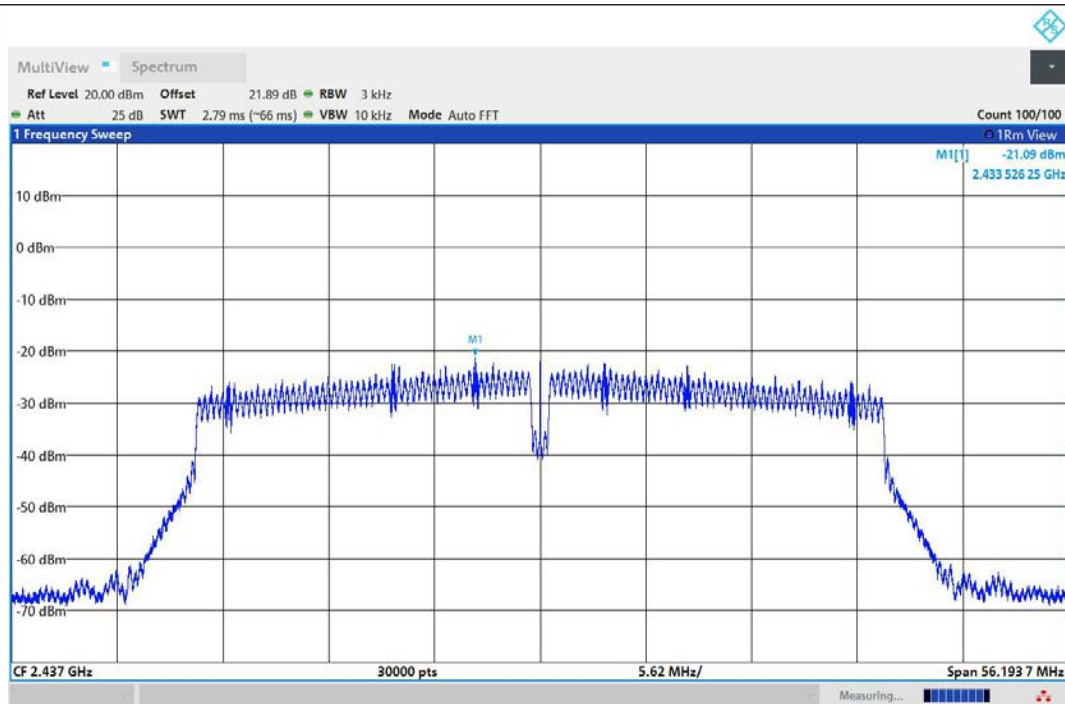
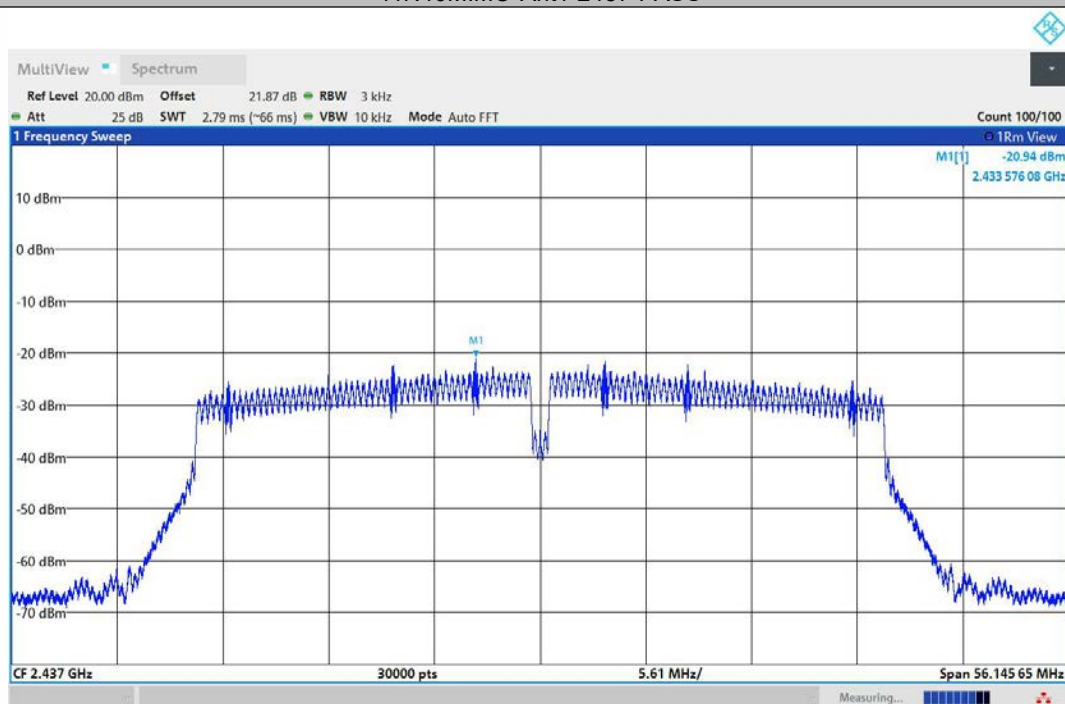
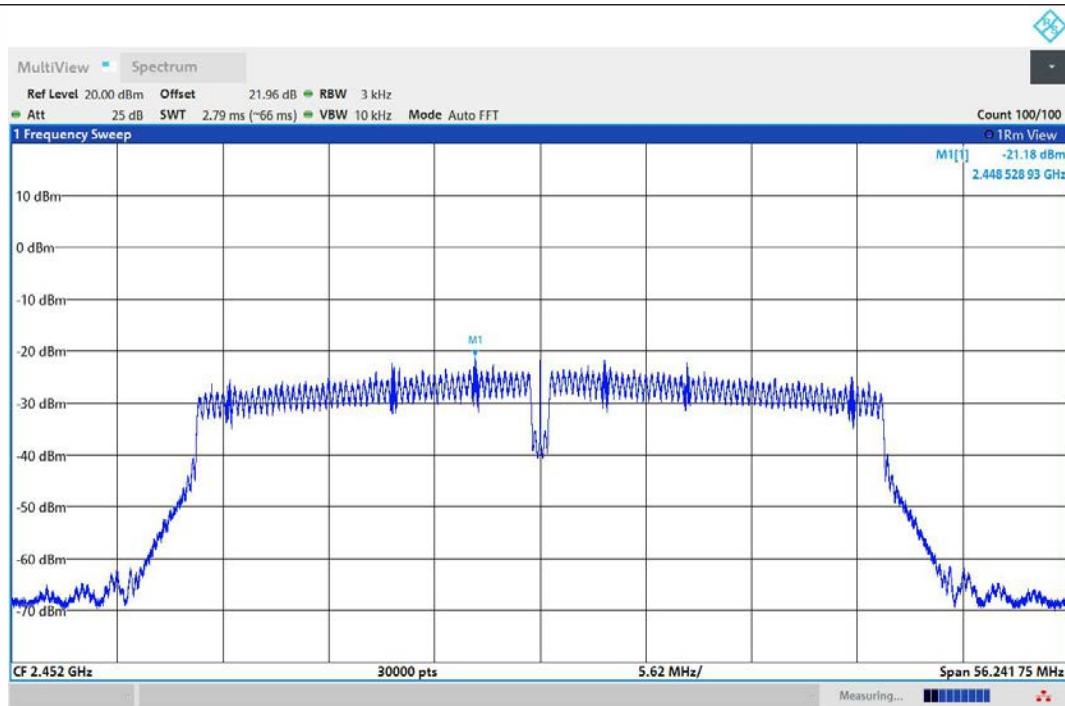




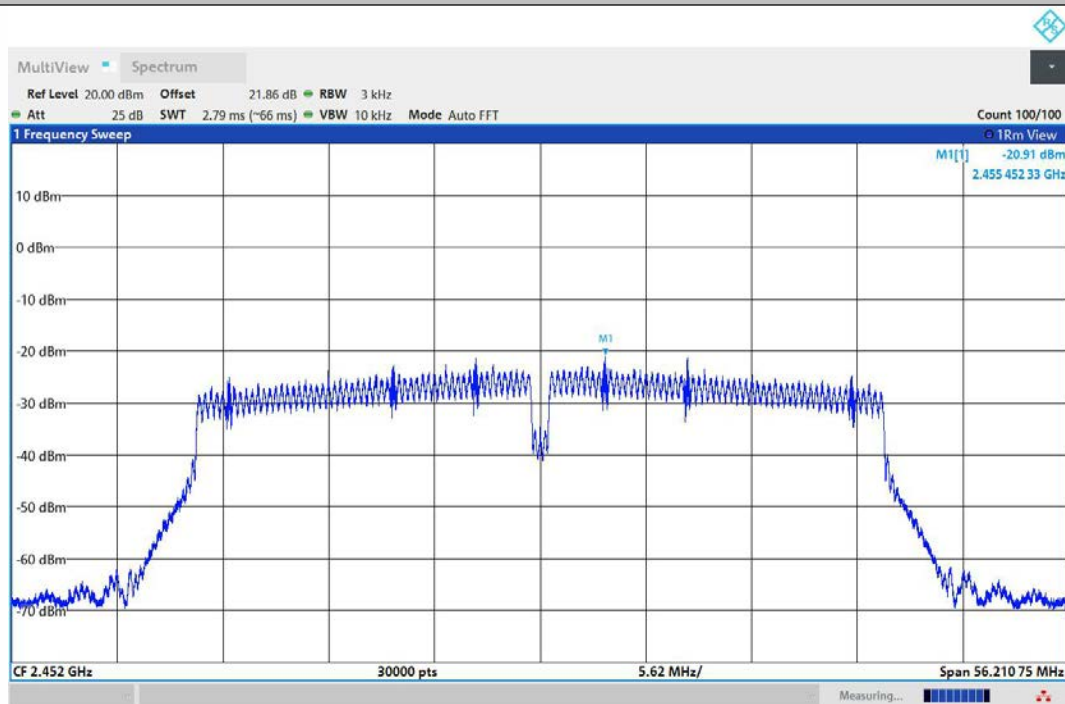
11N40MIMO-Ant1-2437-PASS



11N40MIMO-Ant2-2437-PASS



11N40MIMO-Ant1-2452-PASS



11N40MIMO-Ant2-2452-PASS

7.4 UNWANTED SPURIOUS EMISSIONS

7.4.1 Applicable Standard

According to FCC Part 15.247(d) and KDB 558074 D01 15.247 Meas Guidance v05r02.

7.4.2 Conformance Limit

According to FCC Part 15.247(d):

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under section 5.4(d), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

7.4.3 Test Configuration

Test according to clause 6.1 radio frequency test setup 1.

7.4.4 Test Procedure

The transmitter output (antenna port) was connected to the spectrum analyzer.

■ Reference level measurement

Establish a reference level by using the following procedure:

Set instrument center frequency to DTS channel center frequency.

Set the span to ≥ 1.5 times the DTS bandwidth.

Set the RBW = 100 kHz.

Set the VBW $\geq 3 \times$ RBW.

Set Detector = peak.

Set Sweep time = auto couple.

Set Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum PSD level.

Note that the channel found to contain the maximum PSD level can be used to establish the reference level.

■ Emission level measurement

Set the center frequency and span to encompass frequency range to be measured.

Set the RBW = 100 kHz.

Set the VBW = 300 kHz.

Set Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements. Report the three highest emissions relative to the limit.

7.4.5 Test Results

Temperature :	24.9℃	ATM Pressure:	1011 mbar
Humidity :	49 %	Test Engineer:	GJ

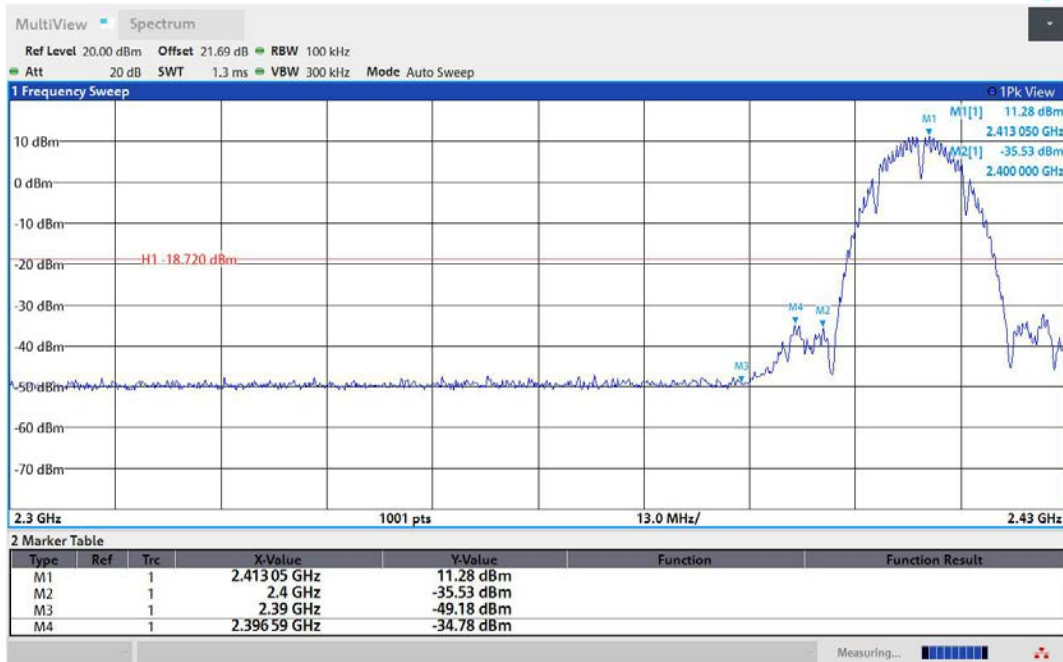
All modulation modes were tested, and the worst data is shown in the table below:

Band edge measurements

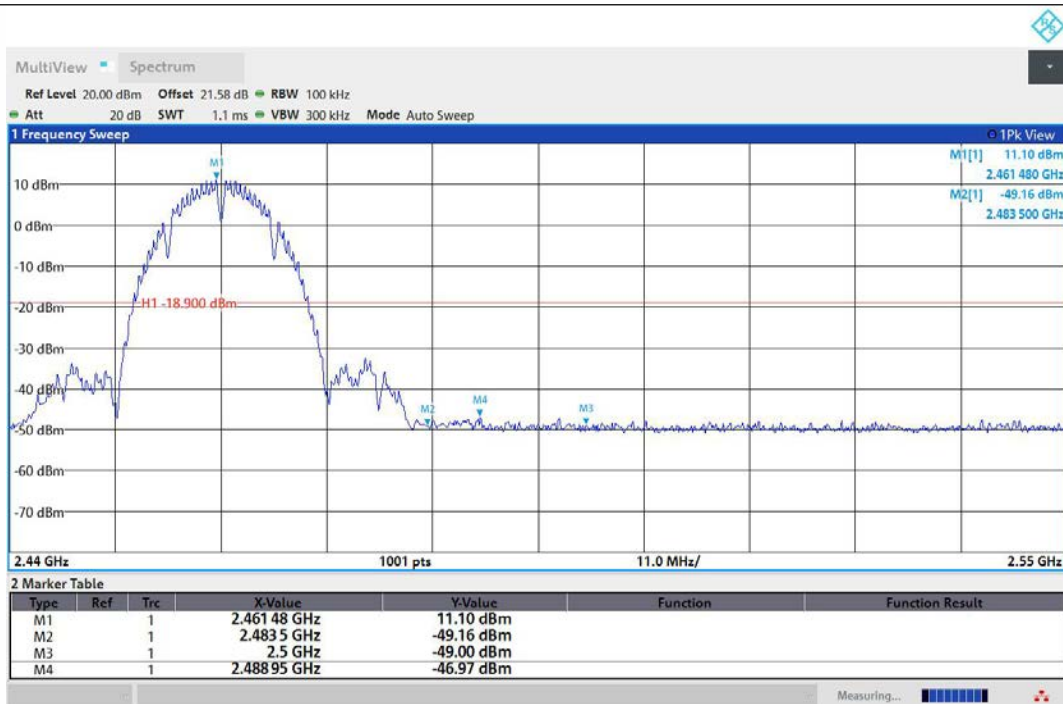
TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	11.11	-33.64	≤-18.89	PASS
11B	Ant2	Low	2412	11.28	-34.78	≤-18.72	PASS
11B	Ant1	High	2462	11.10	-46.97	≤-18.9	PASS
11B	Ant2	High	2462	11.30	-46.65	≤-18.7	PASS
11G	Ant1	Low	2412	9.61	-24.83	≤-20.39	PASS
11G	Ant2	Low	2412	9.88	-24.71	≤-20.12	PASS
11G	Ant1	High	2462	9.62	-34.86	≤-20.38	PASS
11G	Ant2	High	2462	9.78	-36.12	≤-20.22	PASS
11N20MIMO	Ant1	Low	2412	4.27	-39.44	≤-25.73	PASS
11N20MIMO	Ant2	Low	2412	4.36	-39.8	≤-25.64	PASS
11N20MIMO	Ant1	High	2462	4.28	-47.09	≤-25.72	PASS
11N20MIMO	Ant2	High	2462	4.25	-46.98	≤-25.75	PASS
11N40MIMO	Ant1	Low	2422	-0.11	-38.88	≤-30.11	PASS
11N40MIMO	Ant2	Low	2422	0.35	-41.46	≤-29.65	PASS
11N40MIMO	Ant1	High	2452	0.19	-46.6	≤-29.81	PASS
11N40MIMO	Ant2	High	2452	0.30	-46.51	≤-29.7	PASS



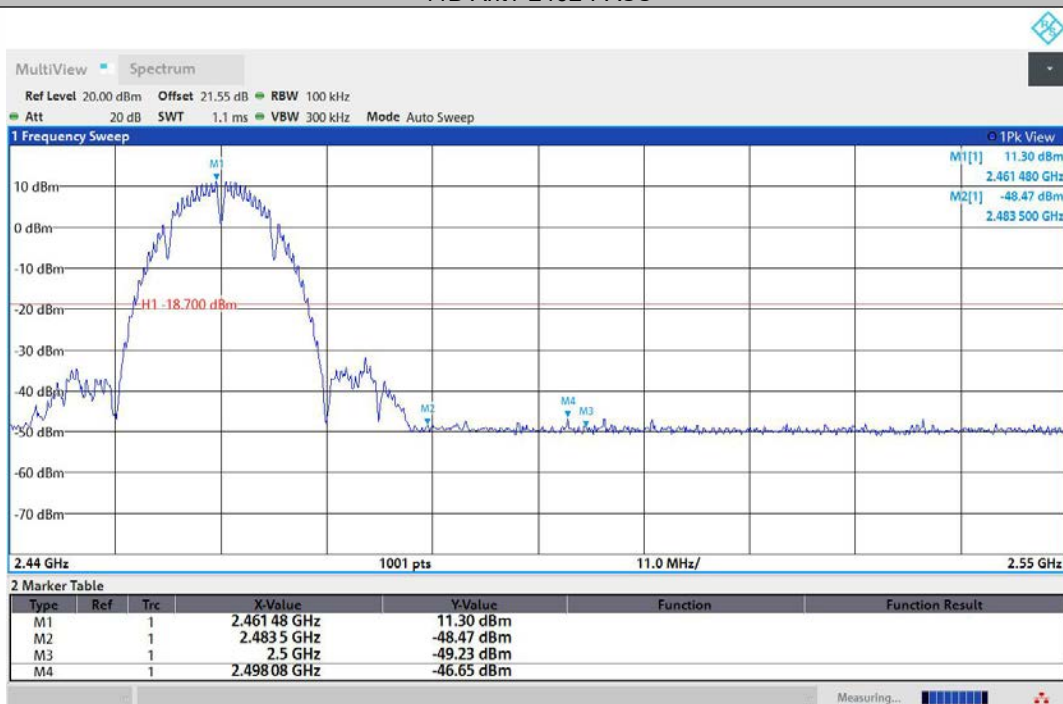
11B-Ant1-2412-PASS



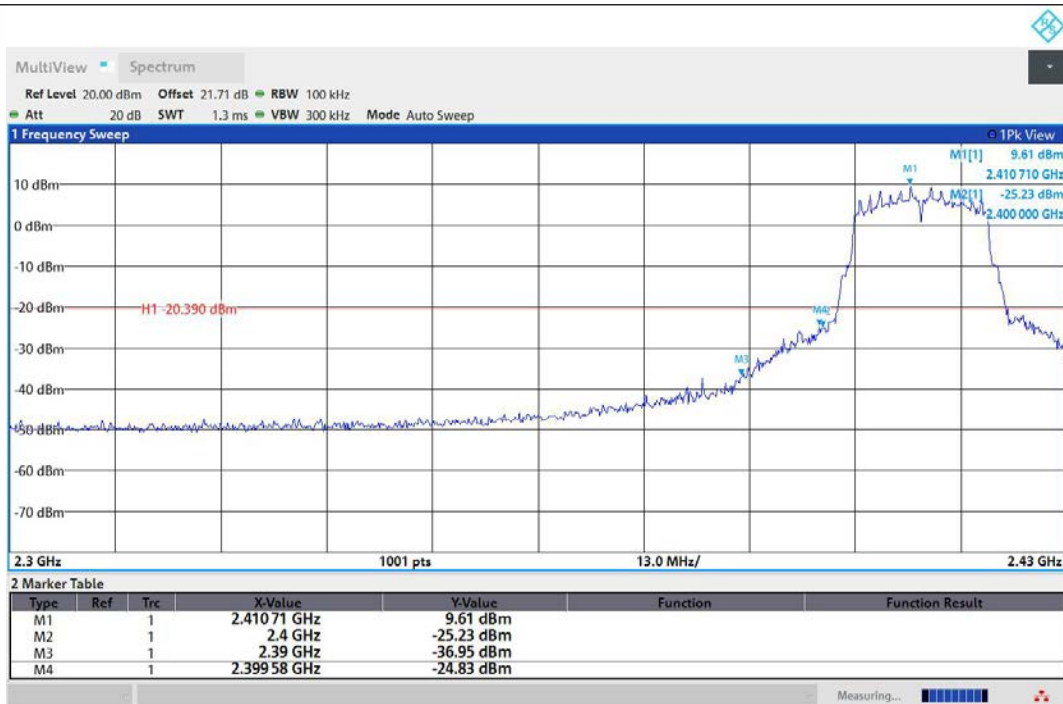
11B-Ant2-2412-PASS



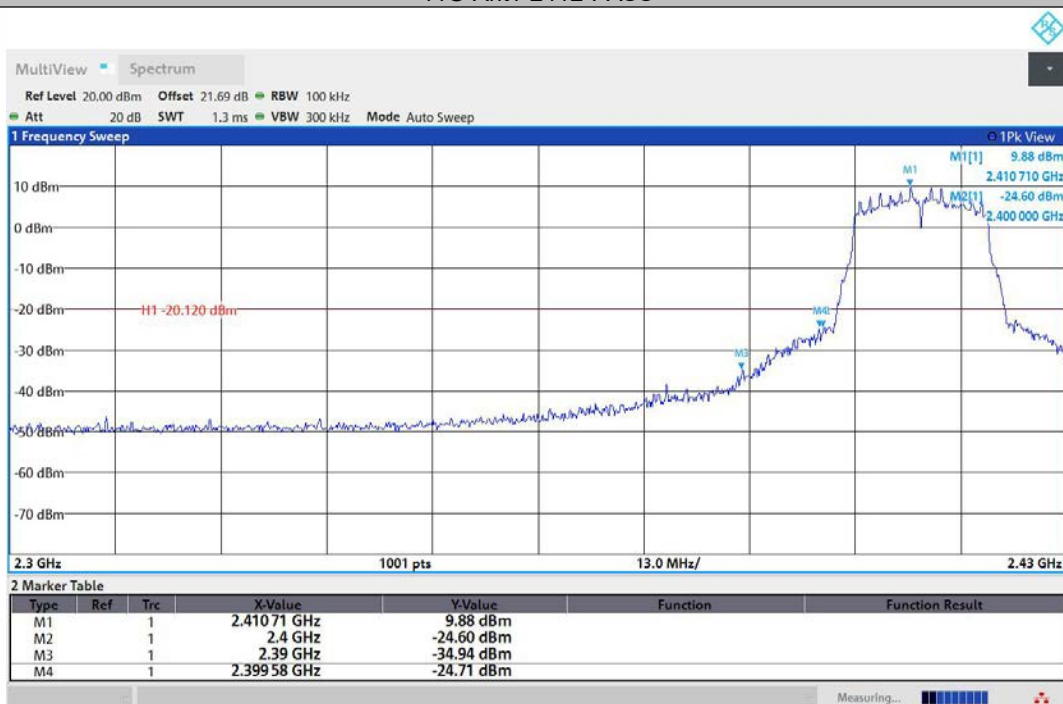
11B-Ant1-2462-PASS



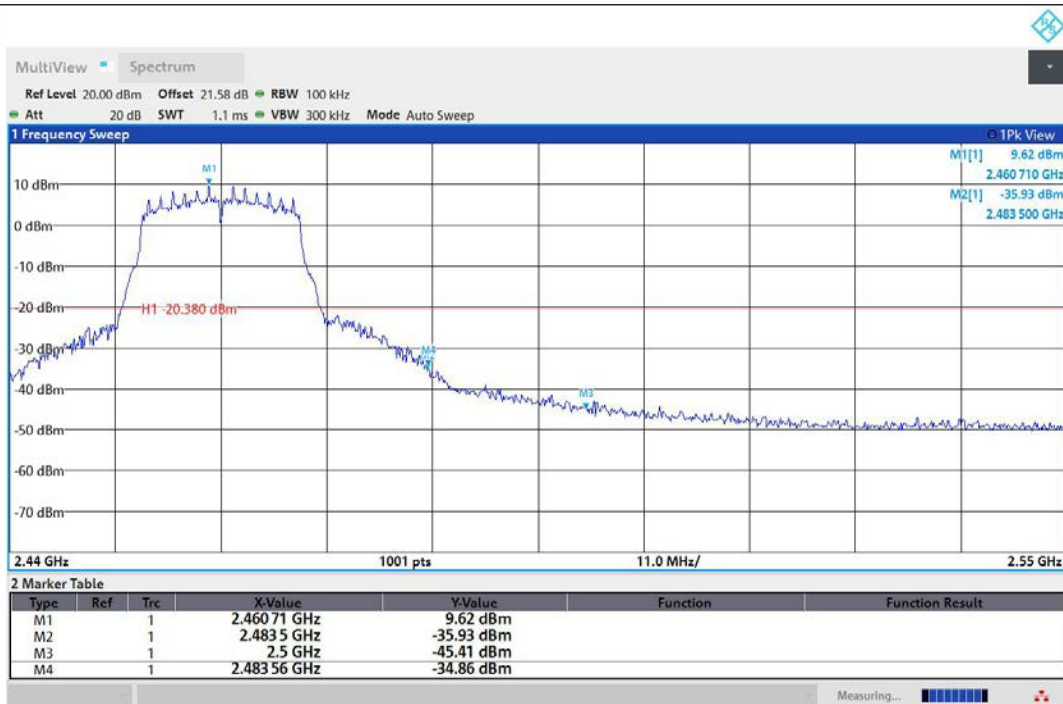
11B-Ant2-2462-PASS



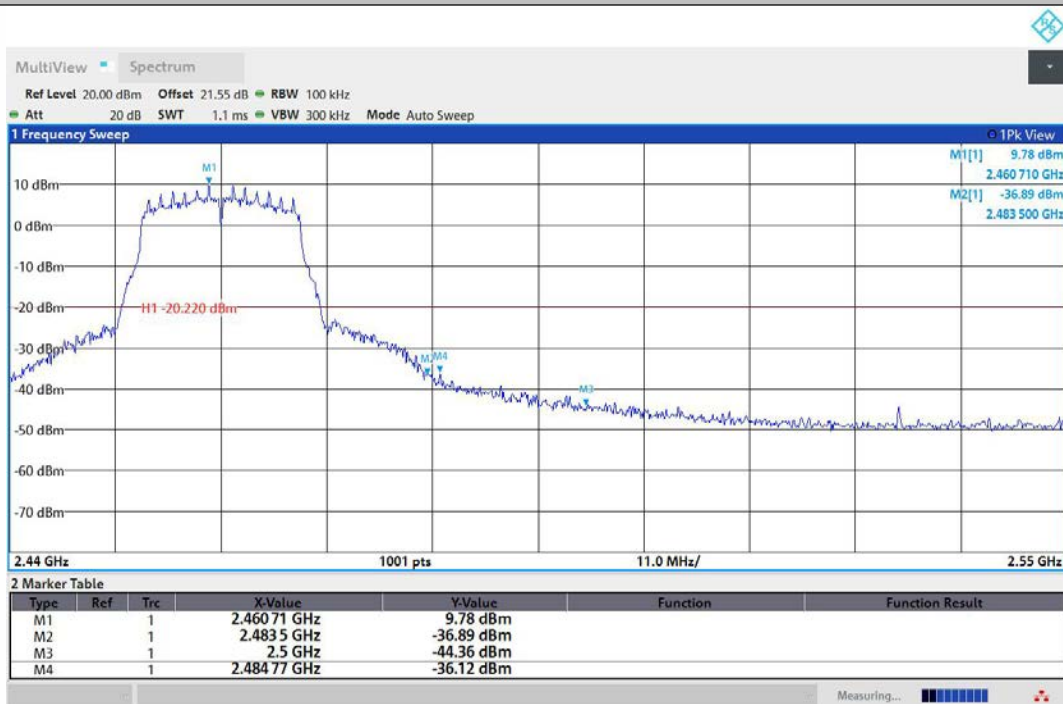
11G-Ant1-2412-PASS



11G-Ant2-2412-PASS



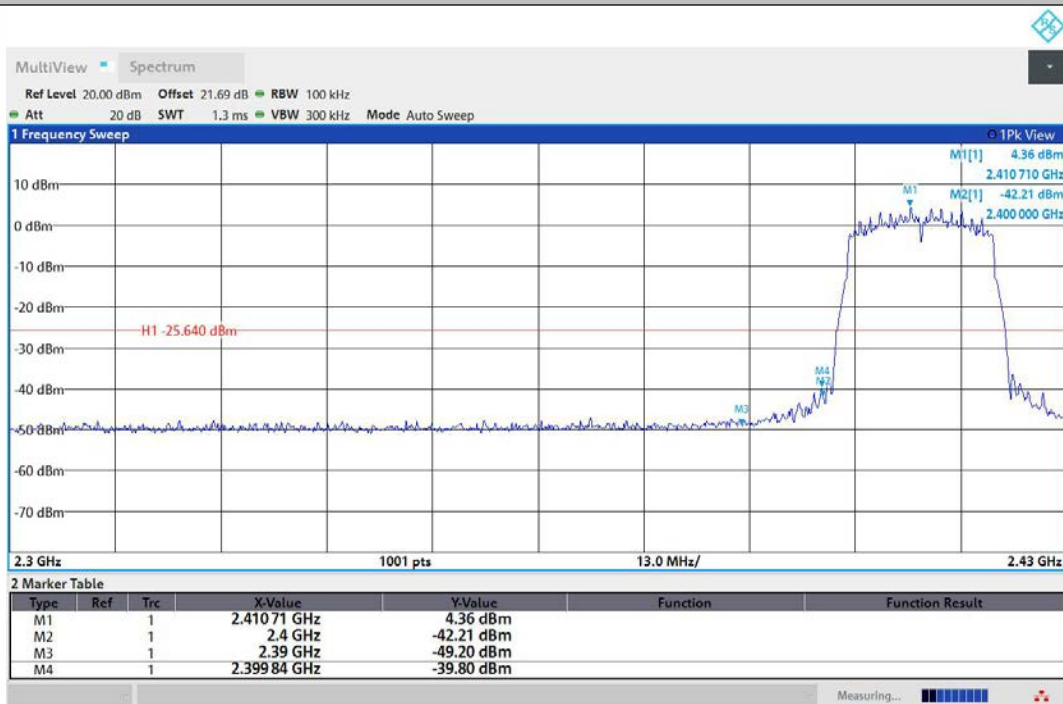
11G-Ant1-2462-PASS



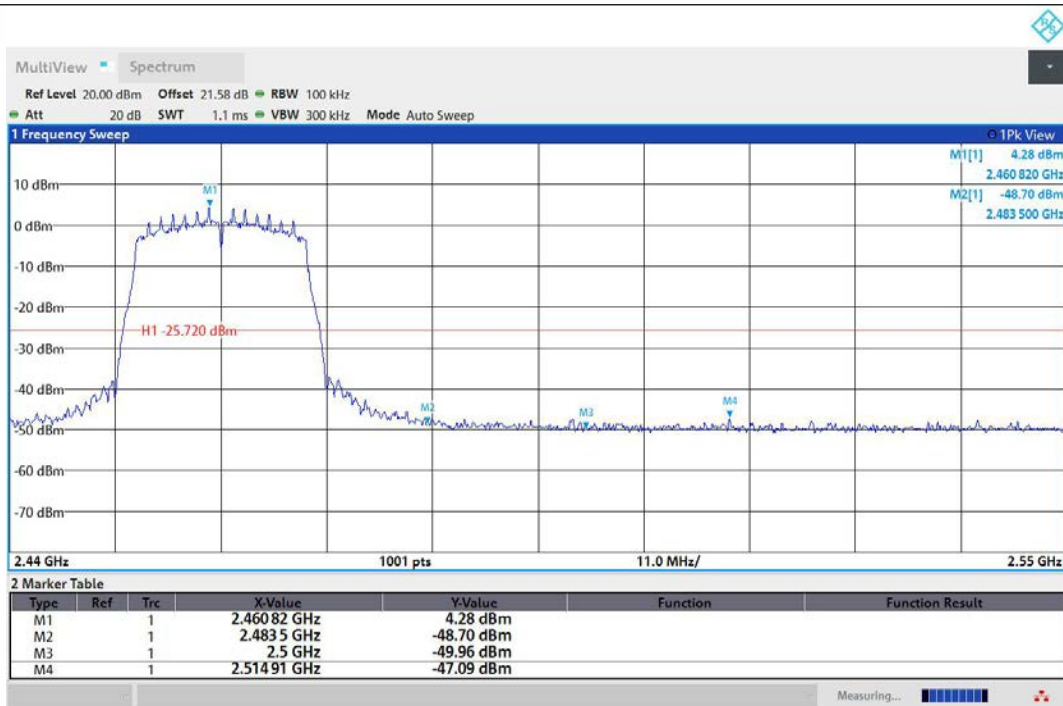
11G-Ant2-2462-PASS



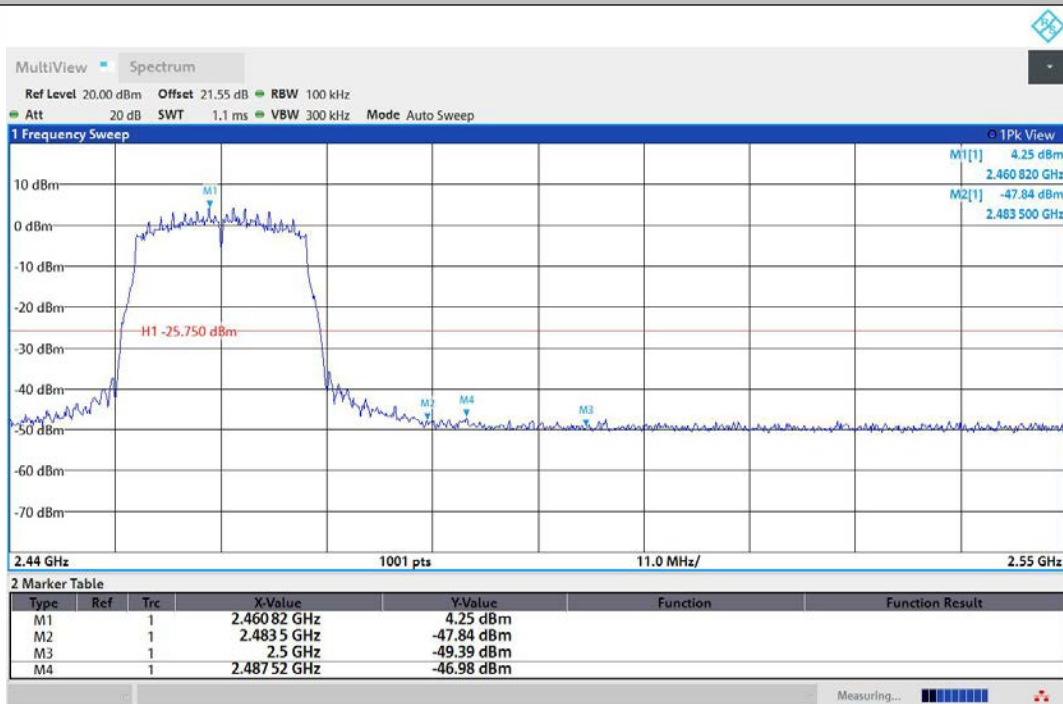
11N20MIMO-Ant1-2412-PASS



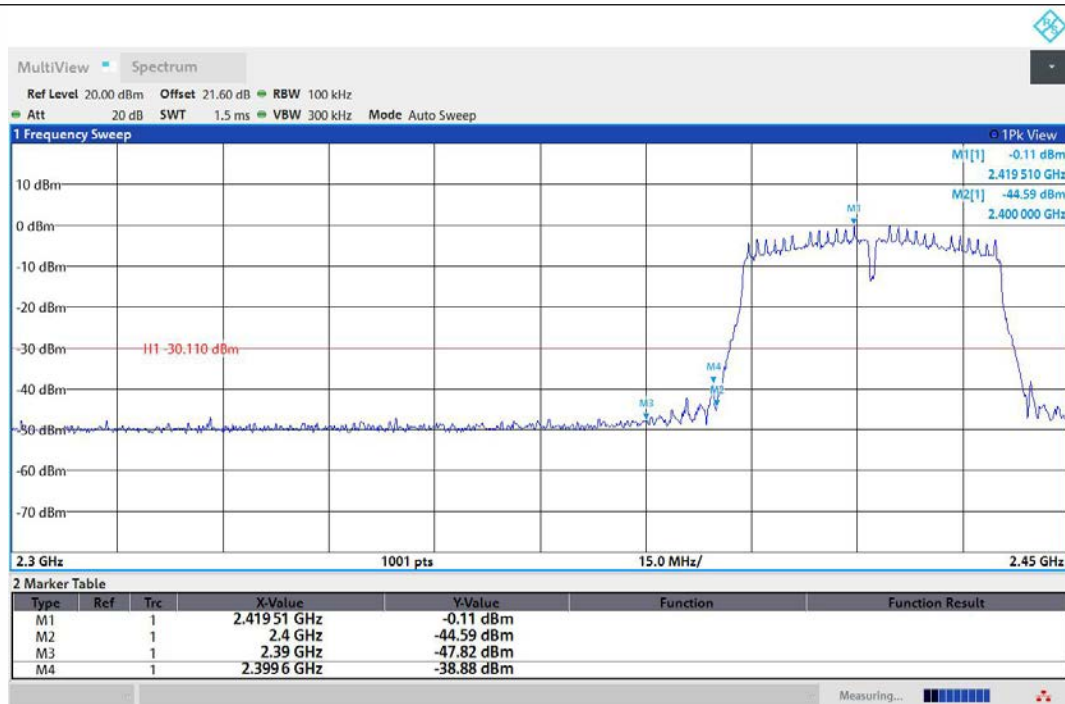
11N20MIMO-Ant2-2412-PASS



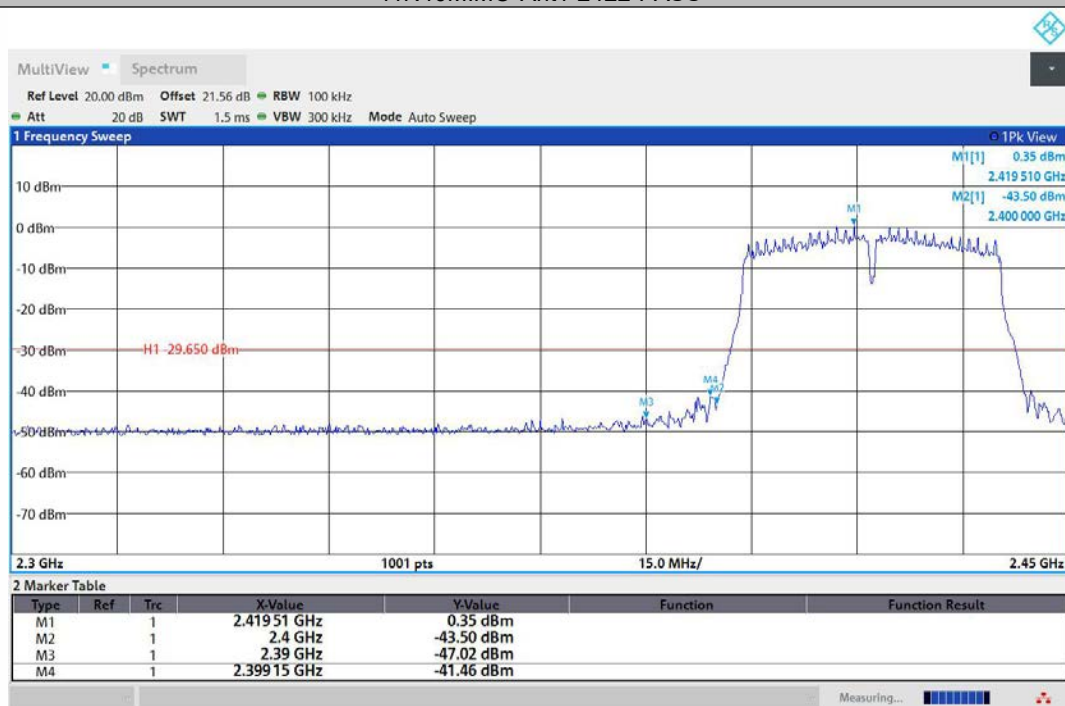
11N20MIMO-Ant1-2462-PASS



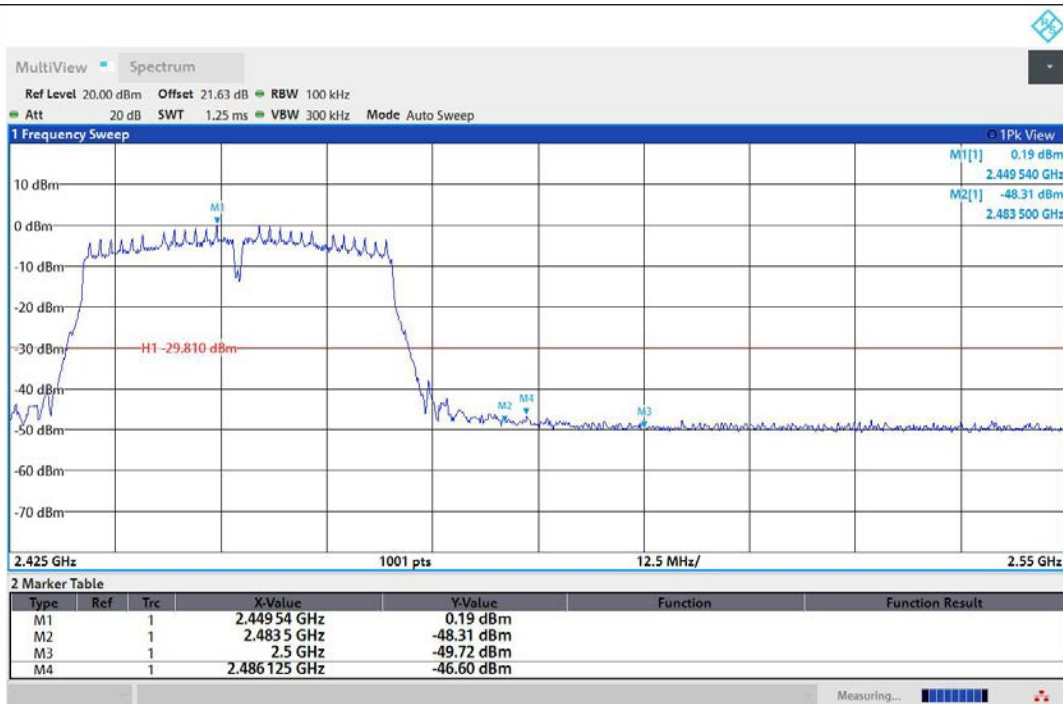
11N20MIMO-Ant2-2462-PASS



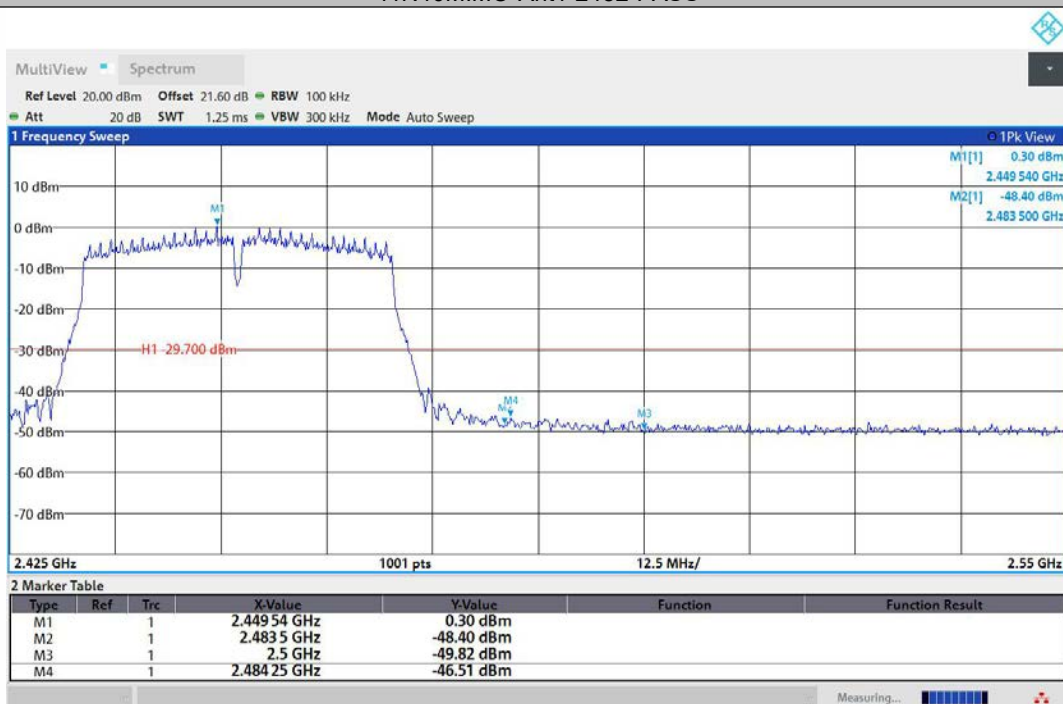
11N40MIMO-Ant1-2422-PASS



11N40MIMO-Ant2-2422-PASS



11N40MIMO-Ant1-2452-PASS



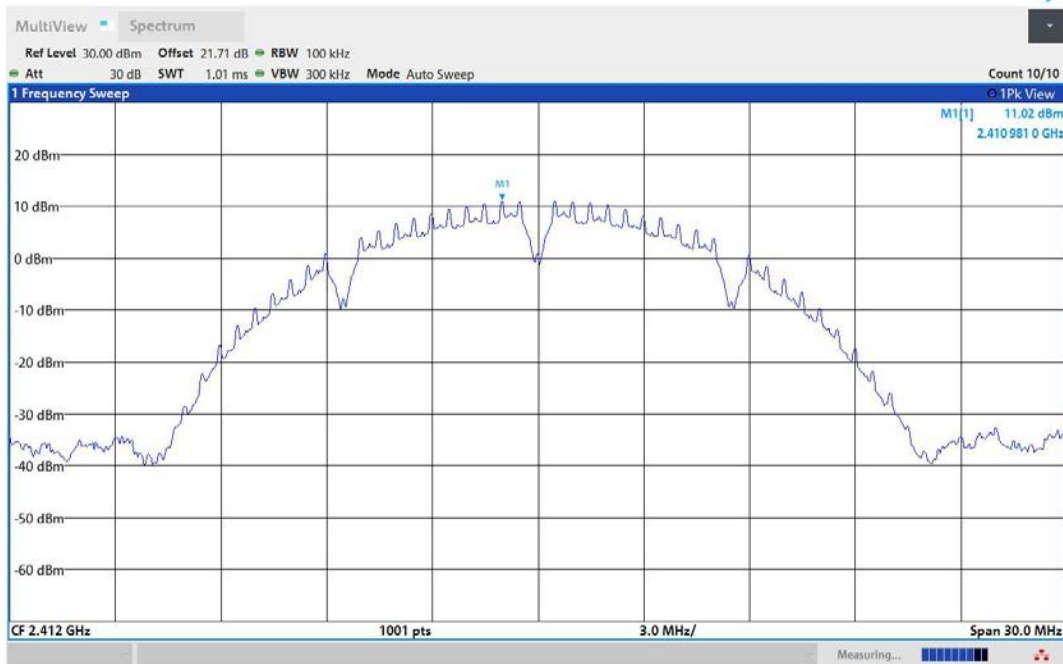
11N40MIMO-Ant2-2452-PASS

Emission level measurement

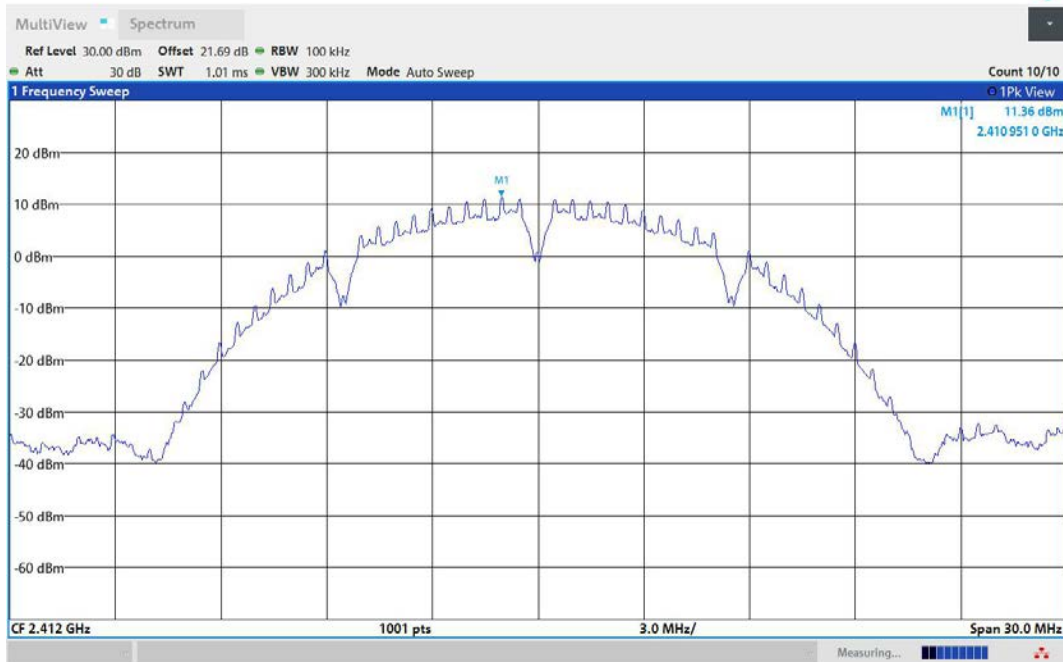
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	0~Reference	11.02	11.02	---	PASS
11B	Ant2	2412	0~Reference	11.36	11.36	---	PASS
11B	Ant1	2412	30~1000	11.02	-54.49	≤-18.98	PASS
11B	Ant2	2412	30~1000	11.36	-54.17	≤-18.64	PASS
11B	Ant1	2412	1000~26500	11.02	-44.57	≤-18.98	PASS
11B	Ant2	2412	1000~26500	11.36	-43.34	≤-18.64	PASS
11B	Ant1	2437	0~Reference	11.29	11.29	---	PASS
11B	Ant2	2437	0~Reference	11.26	11.26	---	PASS
11B	Ant1	2437	30~1000	11.29	-55.74	≤-18.71	PASS
11B	Ant2	2437	30~1000	11.26	-55.37	≤-18.74	PASS
11B	Ant1	2437	1000~26500	11.29	-46.6	≤-18.71	PASS
11B	Ant2	2437	1000~26500	11.26	-45.2	≤-18.74	PASS
11B	Ant1	2462	0~Reference	11.12	11.12	---	PASS
11B	Ant2	2462	0~Reference	11.62	11.62	---	PASS
11B	Ant2	2462	30~1000	11.62	-54.88	≤-18.38	PASS
11B	Ant1	2462	30~1000	11.12	-54.76	≤-18.88	PASS
11B	Ant1	2462	1000~26500	11.12	-47.94	≤-18.88	PASS
11B	Ant2	2462	1000~26500	11.62	-47.67	≤-18.38	PASS
11G	Ant1	2412	0~Reference	9.67	9.67	---	PASS
11G	Ant2	2412	0~Reference	9.77	9.77	---	PASS
11G	Ant1	2412	30~1000	9.67	-55.18	≤-20.33	PASS
11G	Ant2	2412	30~1000	9.77	-54.55	≤-20.23	PASS
11G	Ant1	2412	1000~26500	9.67	-50.6	≤-20.33	PASS
11G	Ant2	2412	1000~26500	9.77	-50.39	≤-20.23	PASS
11G	Ant1	2437	0~Reference	9.54	9.54	---	PASS
11G	Ant2	2437	0~Reference	9.71	9.71	---	PASS
11G	Ant1	2437	30~1000	9.54	-54.63	≤-20.46	PASS
11G	Ant2	2437	30~1000	9.71	-54.38	≤-20.29	PASS
11G	Ant1	2437	1000~26500	9.54	-49.96	≤-20.46	PASS
11G	Ant2	2437	1000~26500	9.71	-48.28	≤-20.29	PASS
11G	Ant1	2462	0~Reference	9.61	9.61	---	PASS
11G	Ant2	2462	0~Reference	9.73	9.73	---	PASS
11G	Ant1	2462	30~1000	9.61	-54.92	≤-20.39	PASS
11G	Ant2	2462	30~1000	9.73	-54.75	≤-20.27	PASS
11G	Ant2	2462	1000~26500	9.73	-48.52	≤-20.27	PASS
11G	Ant1	2462	1000~26500	9.61	-50.35	≤-20.39	PASS
11N20MIMO	Ant1	2412	0~Reference	4.19	4.19	---	PASS
11N20MIMO	Ant2	2412	0~Reference	4.37	4.37	---	PASS
11N20MIMO	Ant1	2412	30~1000	4.19	-55.61	≤-25.81	PASS
11N20MIMO	Ant2	2412	30~1000	4.37	-54.79	≤-25.63	PASS
11N20MIMO	Ant1	2412	1000~26500	4.19	-49.46	≤-25.81	PASS
11N20MIMO	Ant2	2412	1000~26500	4.37	-50.26	≤-25.63	PASS
11N20MIMO	Ant1	2437	0~Reference	4.03	4.03	---	PASS
11N20MIMO	Ant2	2437	0~Reference	4.13	4.13	---	PASS
11N20MIMO	Ant1	2437	30~1000	4.03	-54.92	≤-25.97	PASS
11N20MIMO	Ant2	2437	30~1000	4.13	-55.17	≤-25.87	PASS
11N20MIMO	Ant1	2437	1000~26500	4.03	-50.34	≤-25.97	PASS
11N20MIMO	Ant2	2437	1000~26500	4.13	-50.08	≤-25.87	PASS
11N20MIMO	Ant1	2462	0~Reference	4.32	4.32	---	PASS
11N20MIMO	Ant2	2462	0~Reference	4.26	4.26	---	PASS
11N20MIMO	Ant1	2462	30~1000	4.32	-53.21	≤-25.68	PASS
11N20MIMO	Ant2	2462	30~1000	4.26	-55.01	≤-25.74	PASS
11N20MIMO	Ant1	2462	1000~26500	4.32	-49.68	≤-25.68	PASS
11N20MIMO	Ant2	2462	1000~26500	4.26	-50.01	≤-25.74	PASS
11N40MIMO	Ant1	2422	0~Reference	-0.06	-0.06	---	PASS
11N40MIMO	Ant2	2422	0~Reference	0.42	0.42	---	PASS
11N40MIMO	Ant1	2422	30~1000	-0.06	-54.18	≤-30.06	PASS
11N40MIMO	Ant2	2422	30~1000	0.42	-54.95	≤-29.58	PASS
11N40MIMO	Ant1	2422	1000~26500	-0.06	-49.91	≤-30.06	PASS

11N40MIMO	Ant2	2422	1000~26500	0.42	-49.83	≤-29.58	PASS
11N40MIMO	Ant1	2437	0~Reference	0.14	0.14	---	PASS
11N40MIMO	Ant2	2437	0~Reference	0.40	0.40	---	PASS
11N40MIMO	Ant1	2437	30~1000	0.14	-54.78	≤-29.86	PASS
11N40MIMO	Ant2	2437	30~1000	0.40	-55.34	≤-29.6	PASS
11N40MIMO	Ant1	2437	1000~26500	0.14	-50.22	≤-29.86	PASS
11N40MIMO	Ant2	2437	1000~26500	0.40	-48.6	≤-29.6	PASS
11N40MIMO	Ant1	2452	0~Reference	0.18	0.18	---	PASS
11N40MIMO	Ant2	2452	0~Reference	0.31	0.31	---	PASS
11N40MIMO	Ant1	2452	30~1000	0.18	-54.53	≤-29.82	PASS
11N40MIMO	Ant2	2452	30~1000	0.31	-54.84	≤-29.69	PASS
11N40MIMO	Ant1	2452	1000~26500	0.18	-50.13	≤-29.82	PASS
11N40MIMO	Ant2	2452	1000~26500	0.31	-49.67	≤-29.69	PASS

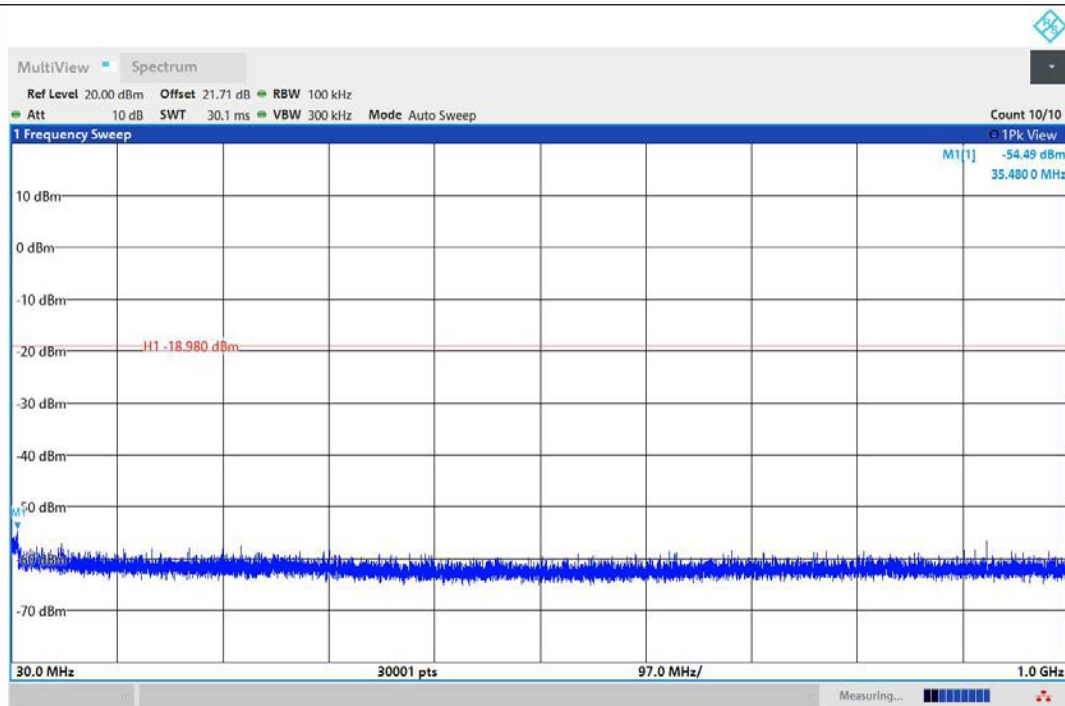




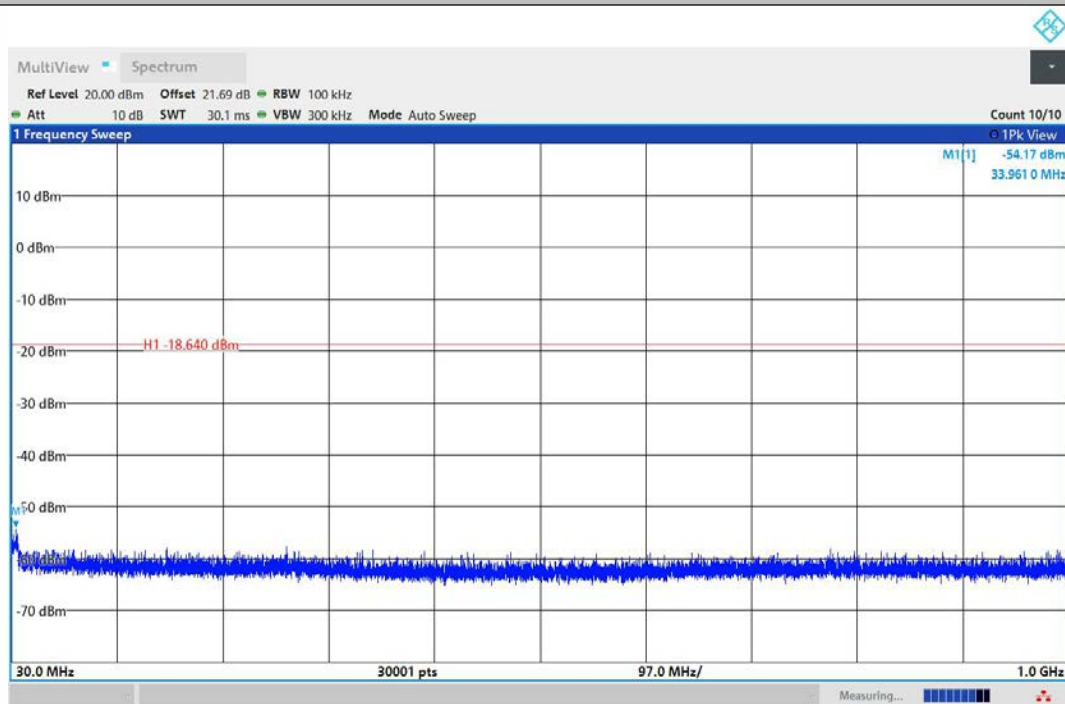
11B-Ant1-2412-0~Reference-PASS



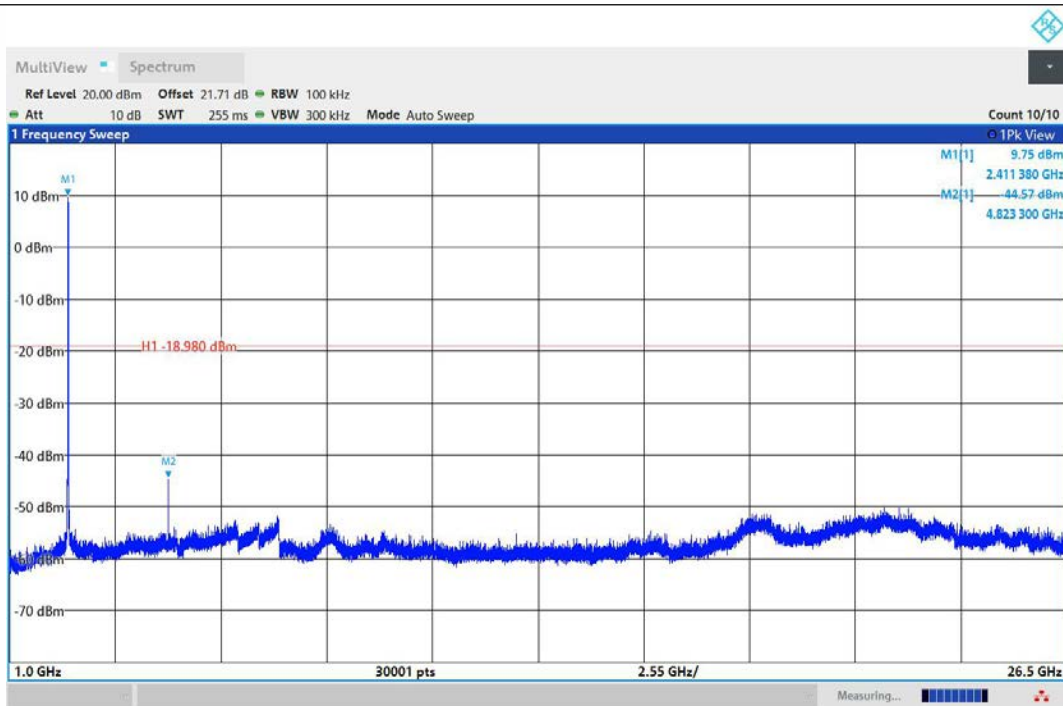
11B-Ant2-2412-0~Reference-PASS



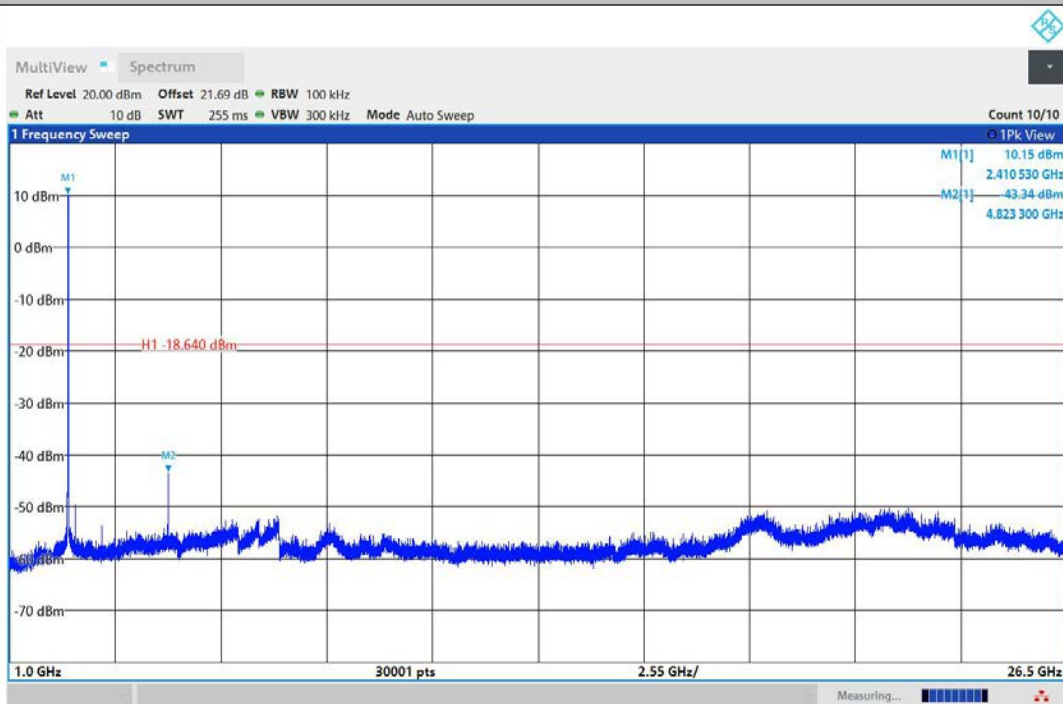
11B-Ant1-2412-30~1000-PASS



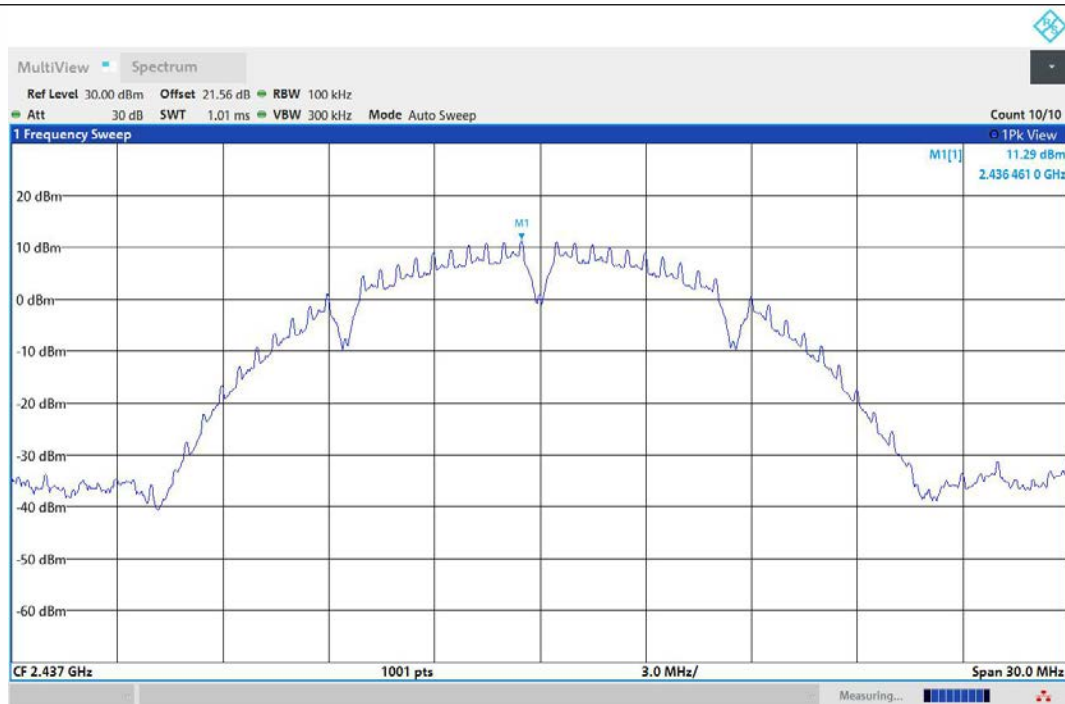
11B-Ant2-2412-30~1000-PASS



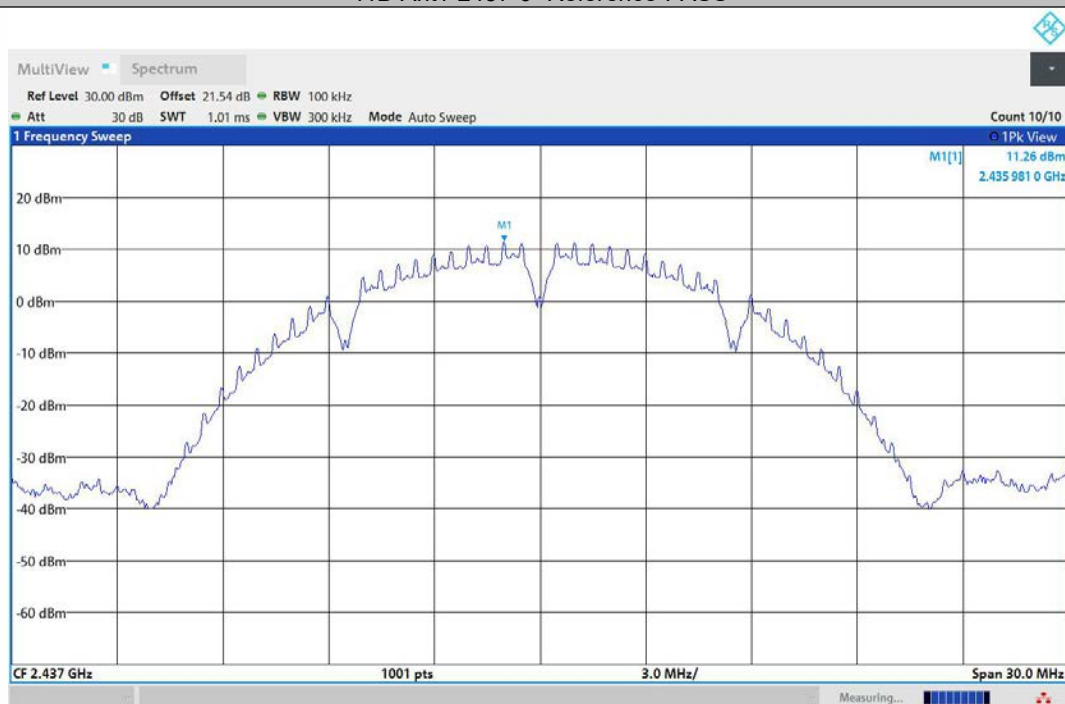
11B-Ant1-2412-1000~26500-PASS



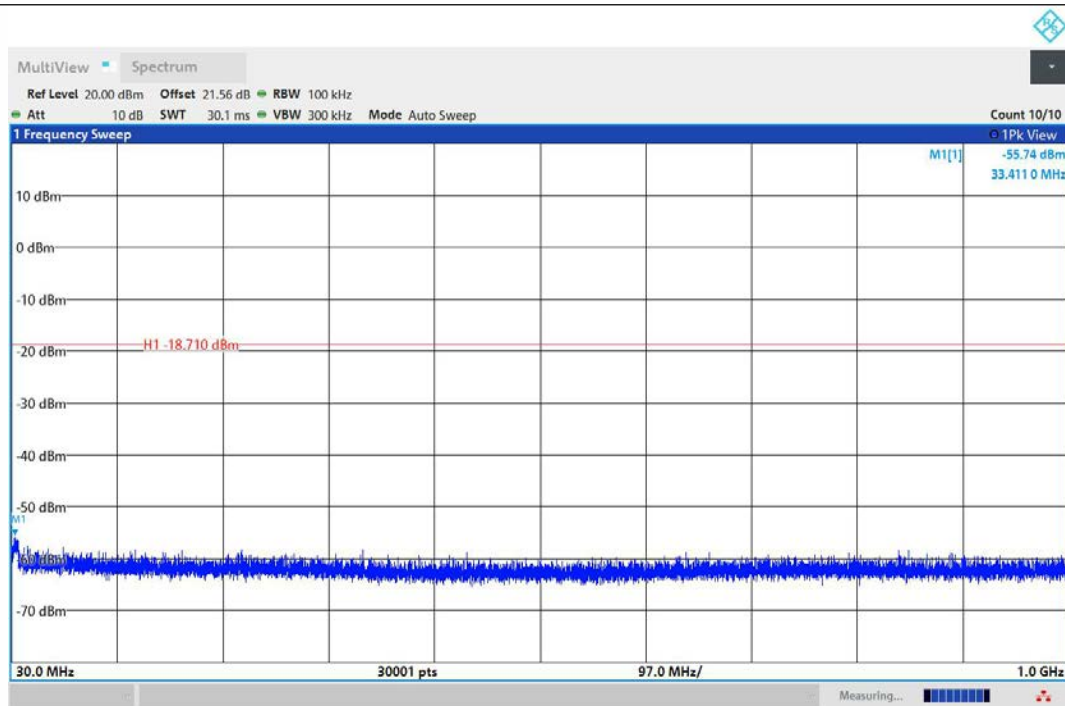
11B-Ant2-2412-1000~26500-PASS



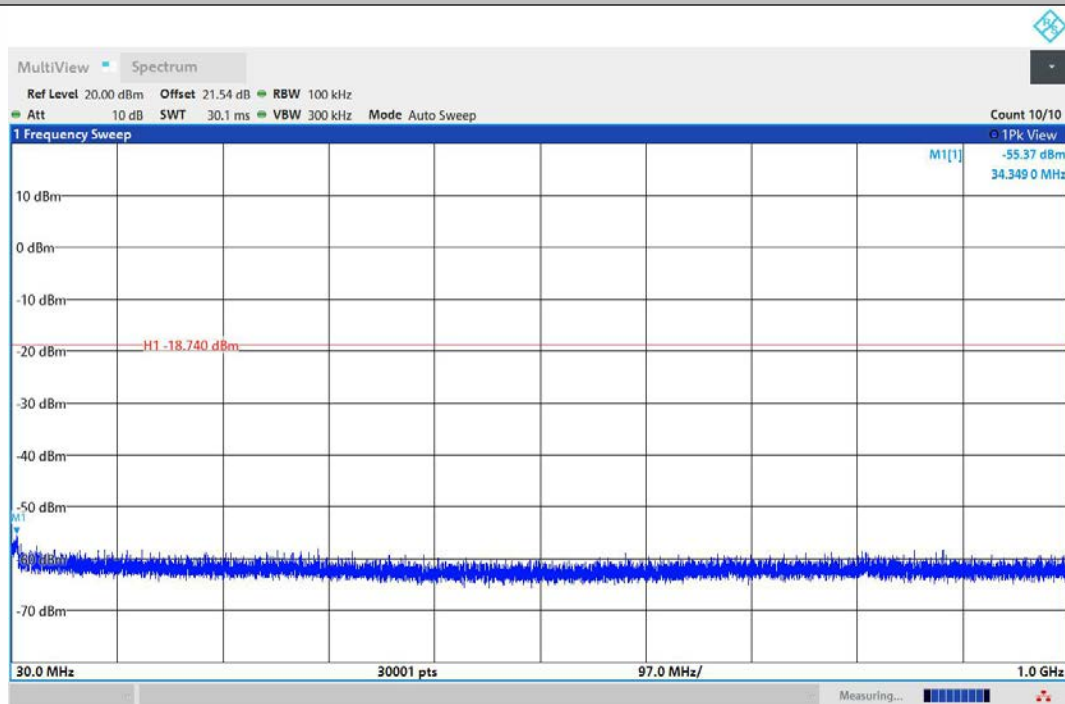
11B-Ant1-2437-0~Reference-PASS



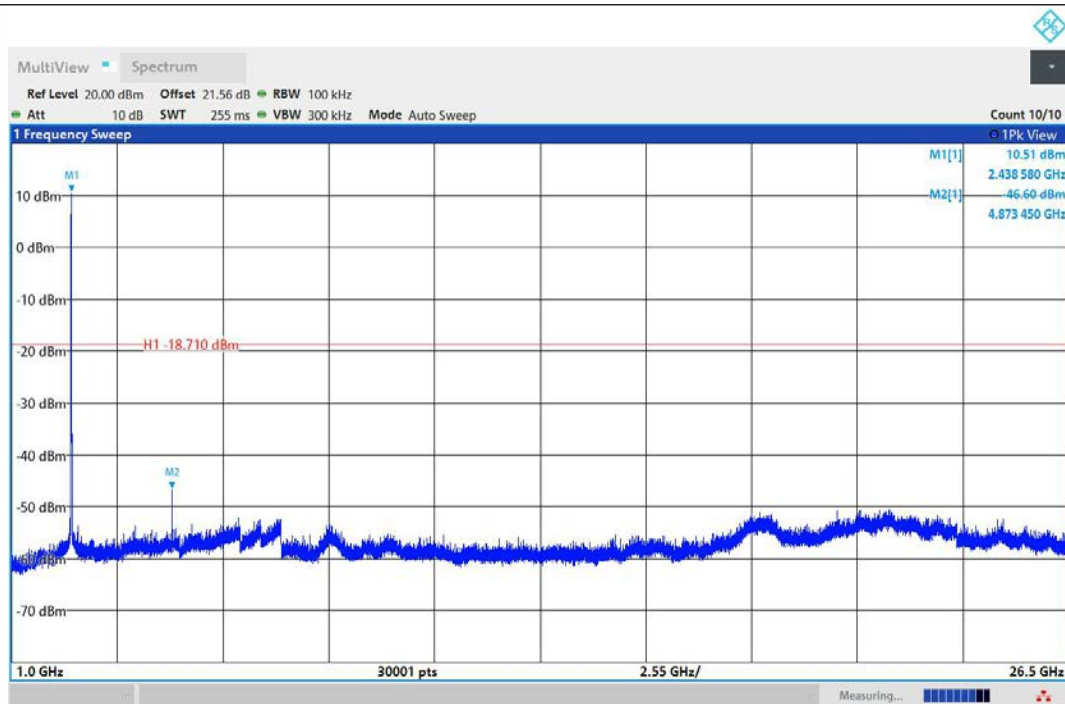
11B-Ant2-2437-0~Reference-PASS



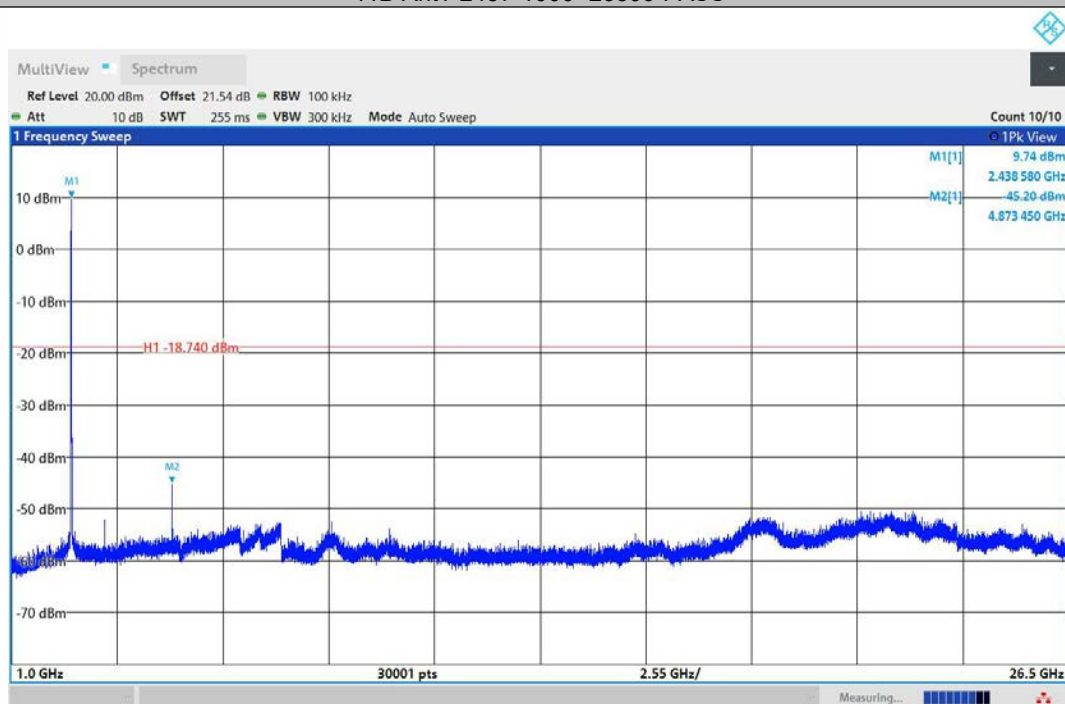
11B-Ant1-2437-30~1000-PASS



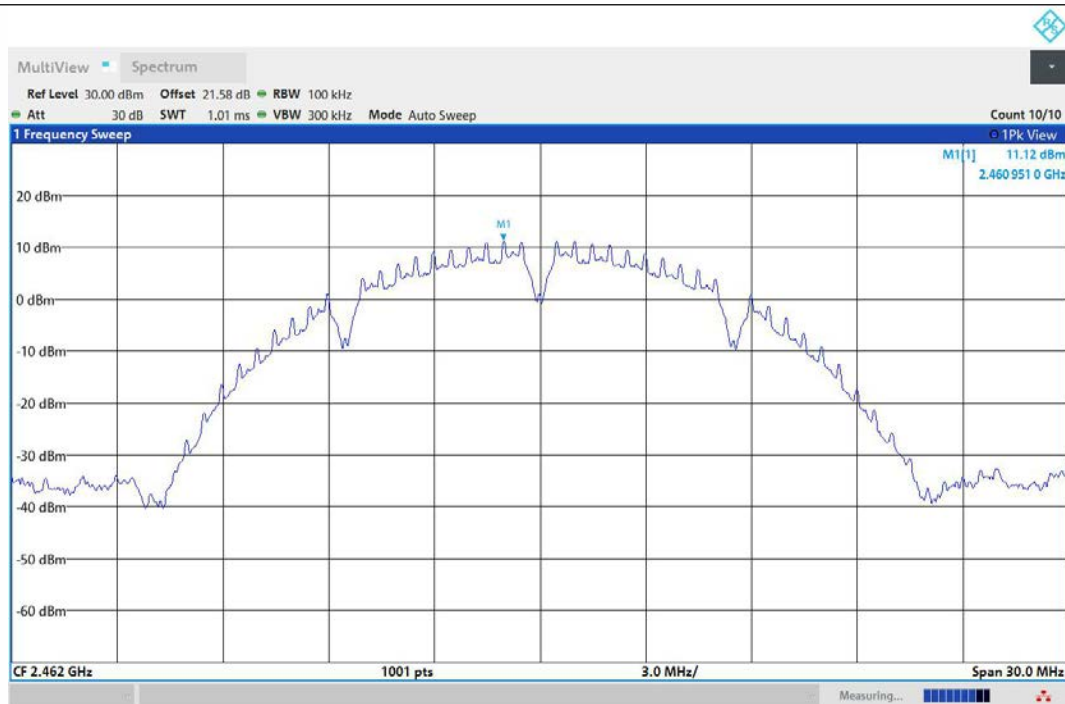
11B-Ant2-2437-30~1000-PASS



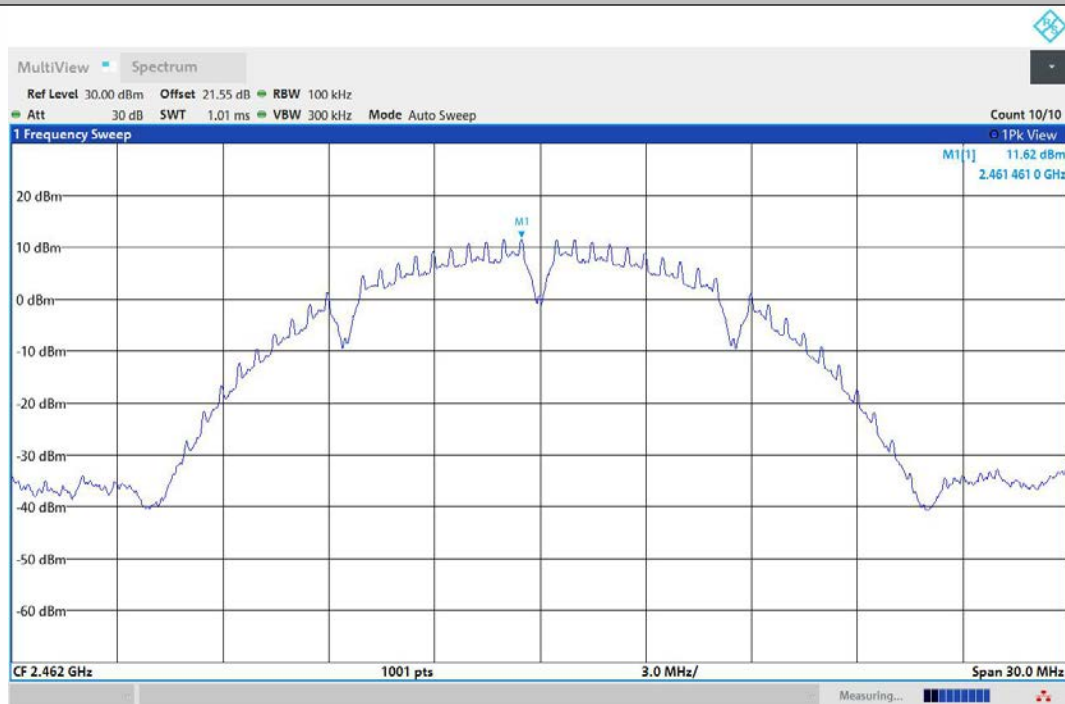
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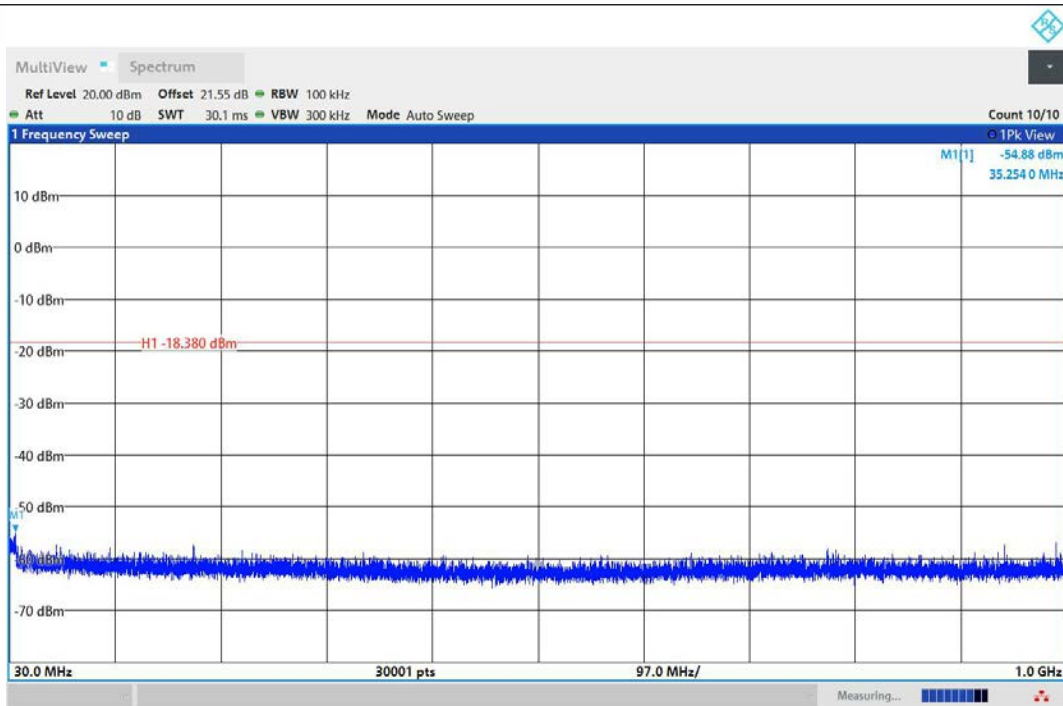
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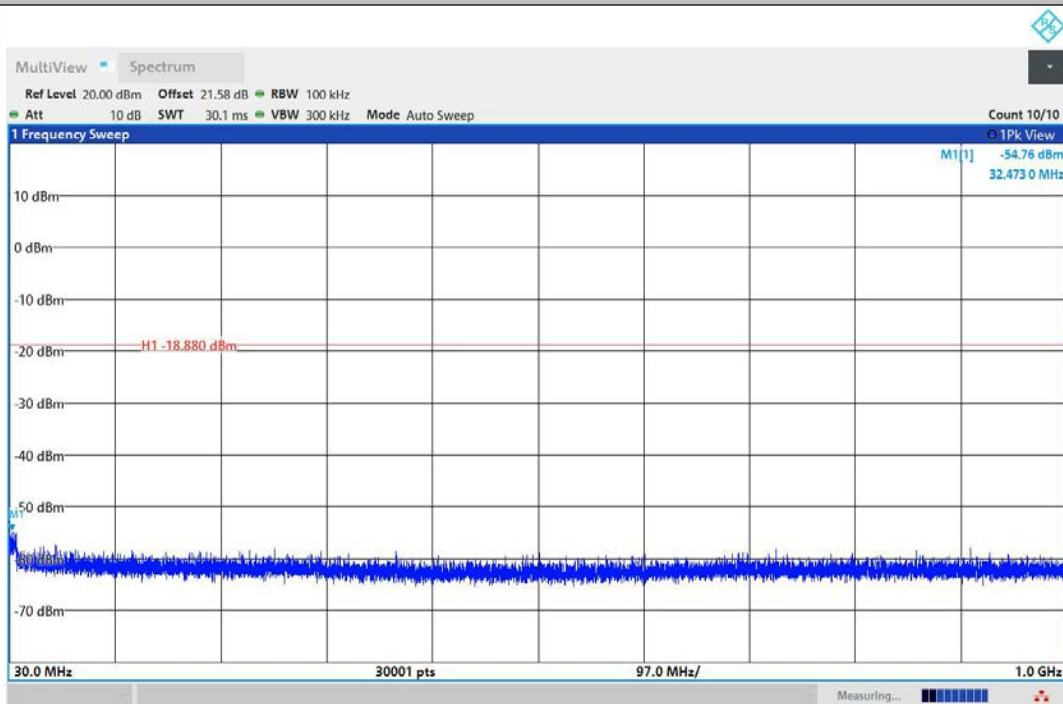
11B-Ant1-2462-0~Reference-PASS



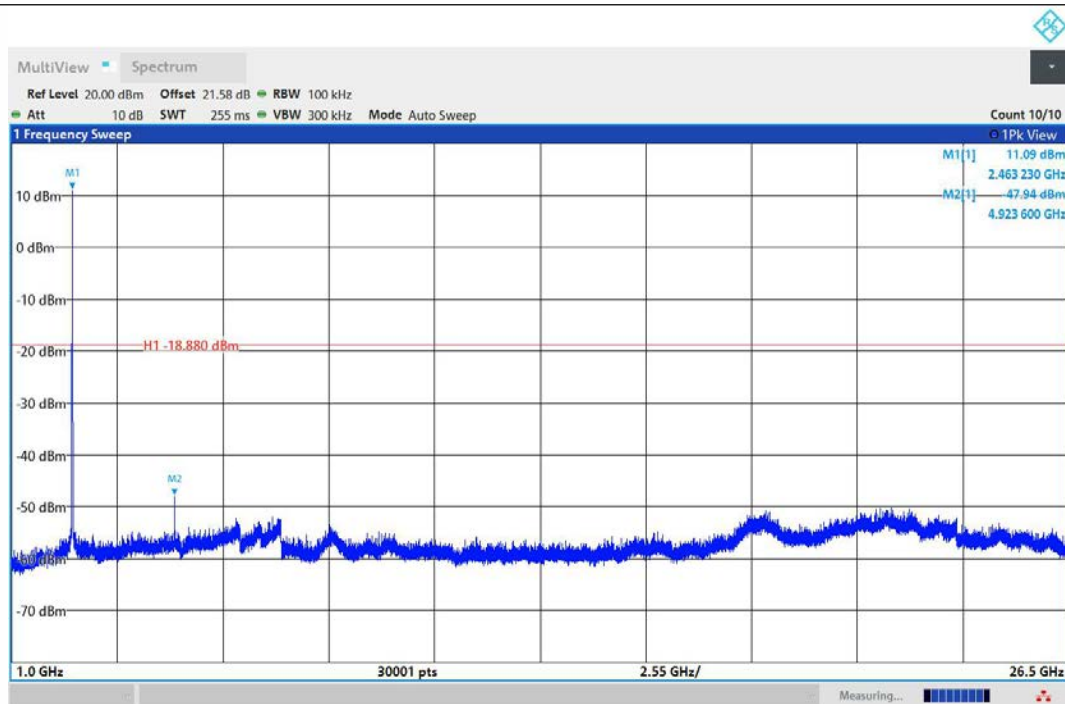
11B-Ant2-2462-0~Reference-PASS



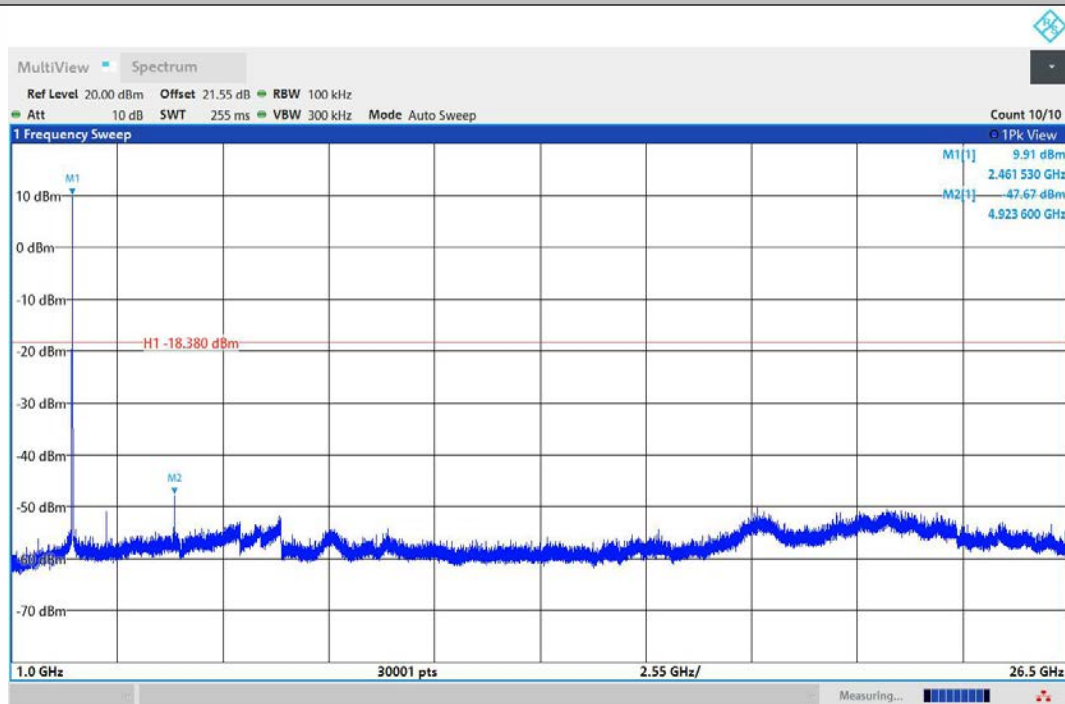
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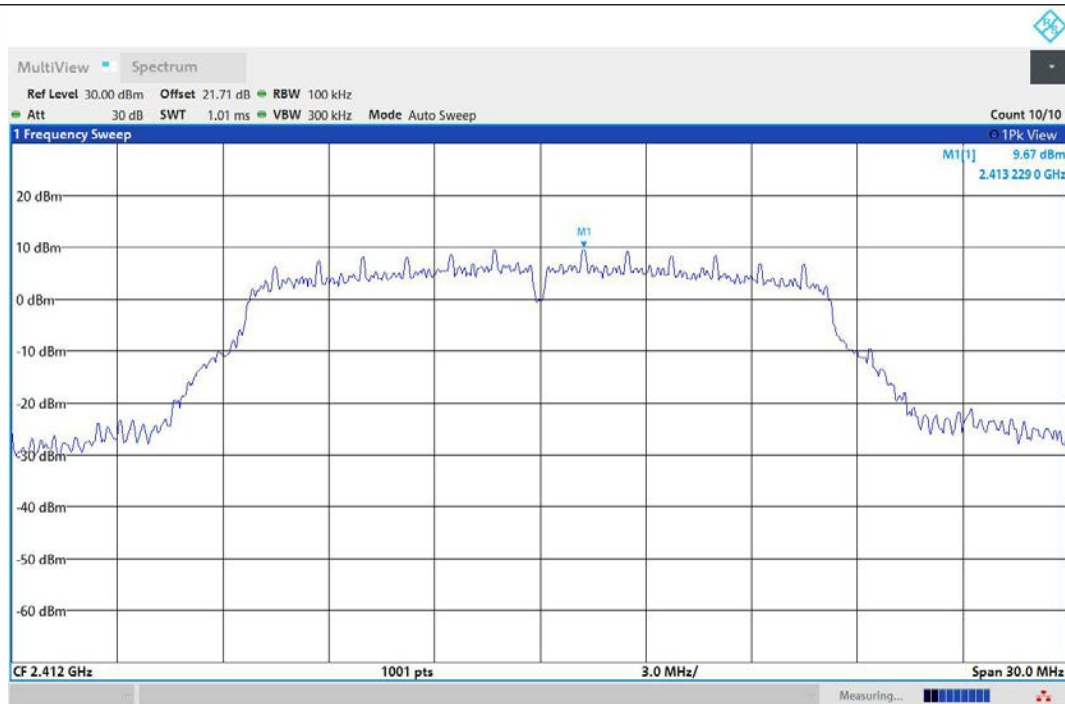
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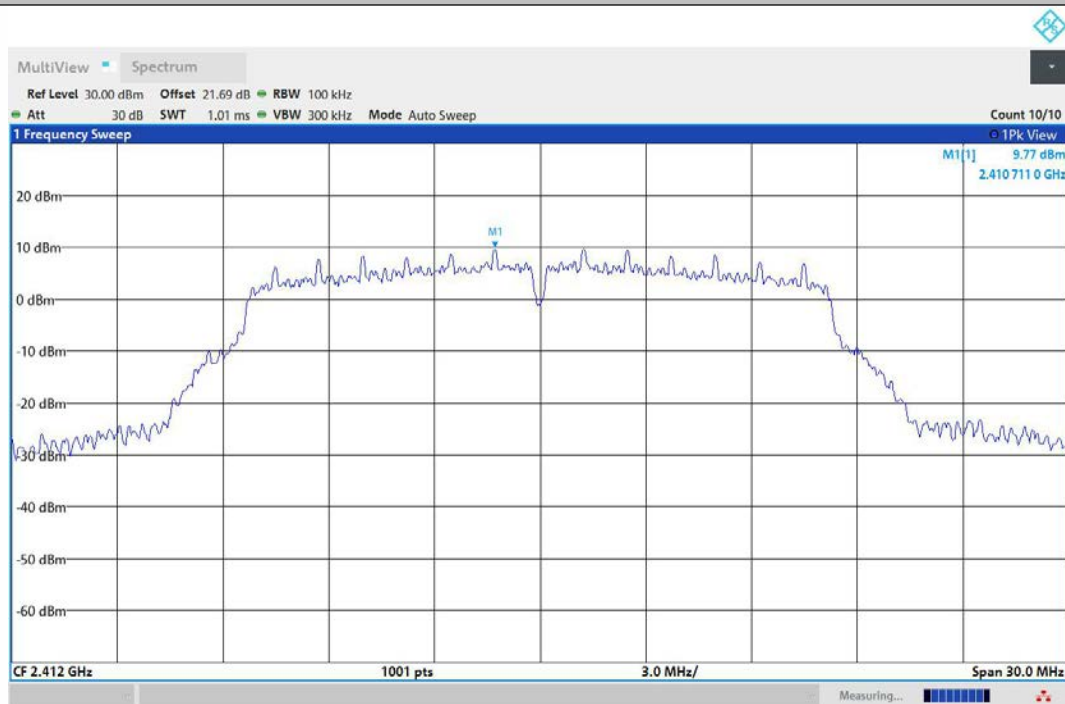
11B-Ant1-2462-1000~26500-PASS



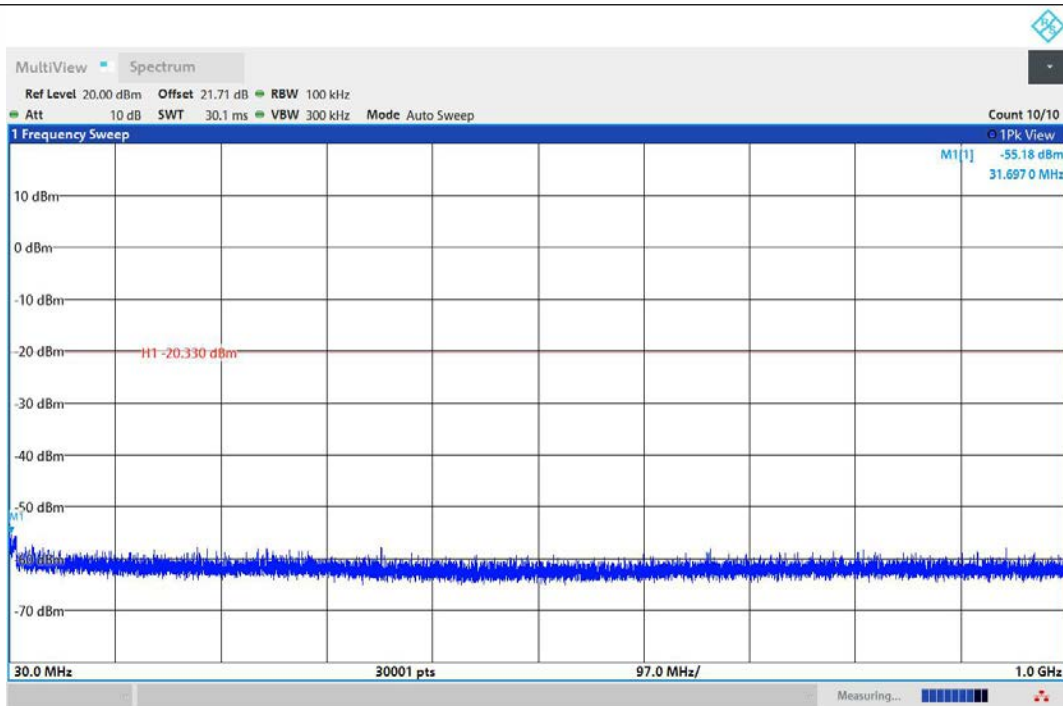
11B-Ant2-2462-1000~26500-PASS



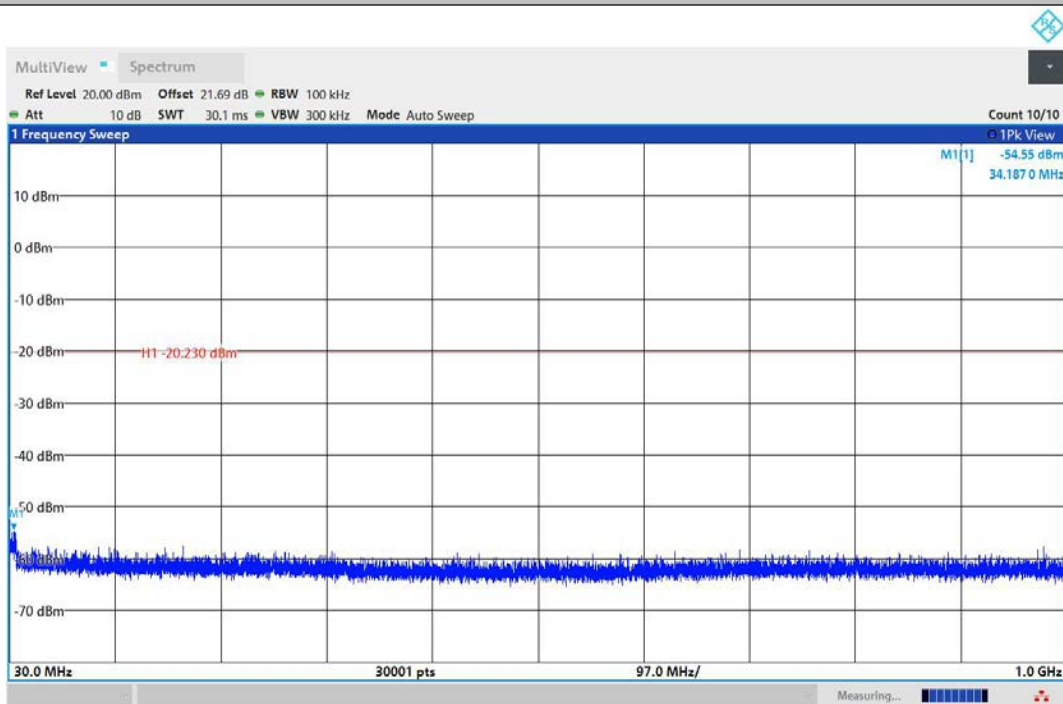
11G-Ant1-2412-0~Reference-PASS



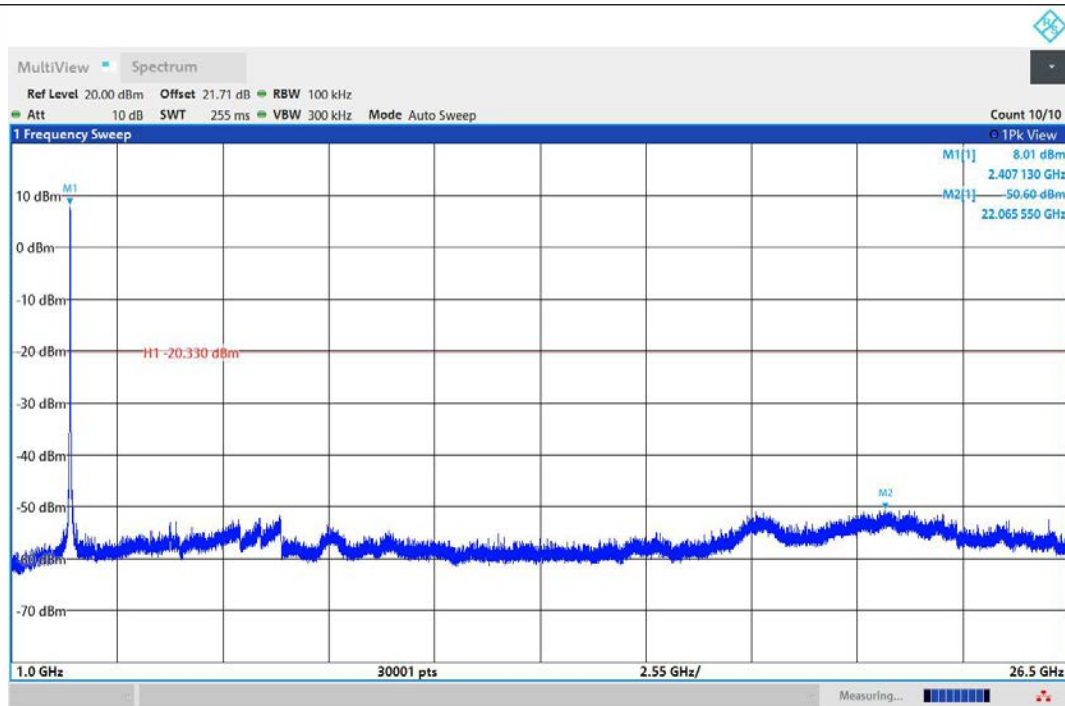
11G-Ant2-2412-0~Reference-PASS



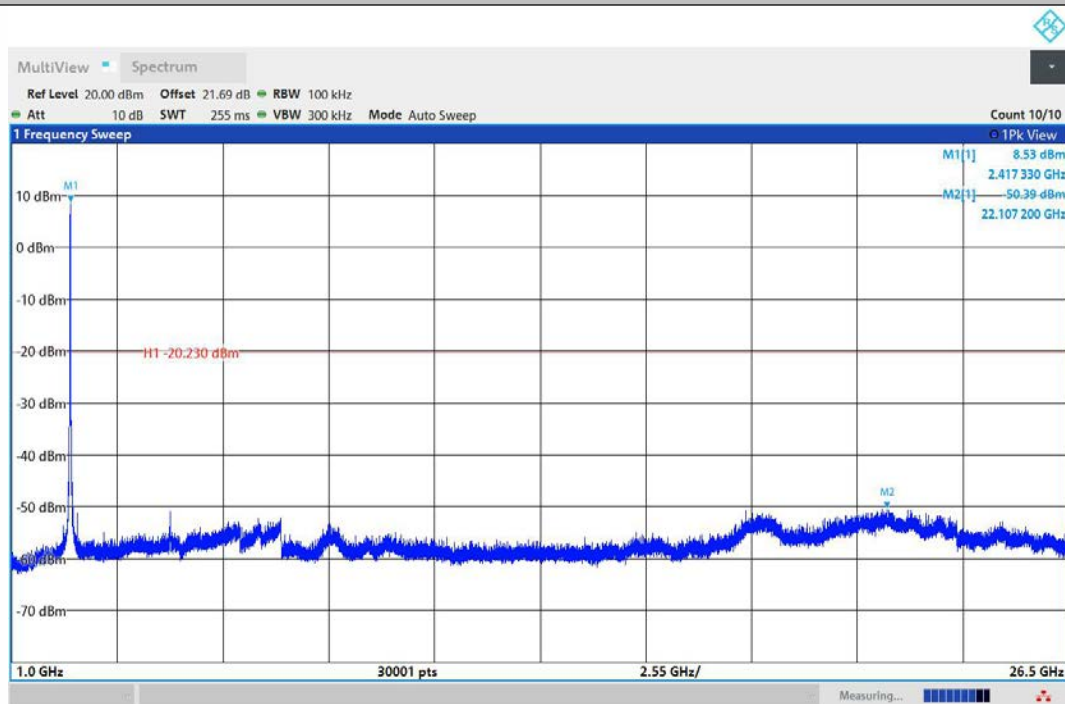
11G-Ant1-2412-30~1000-PASS



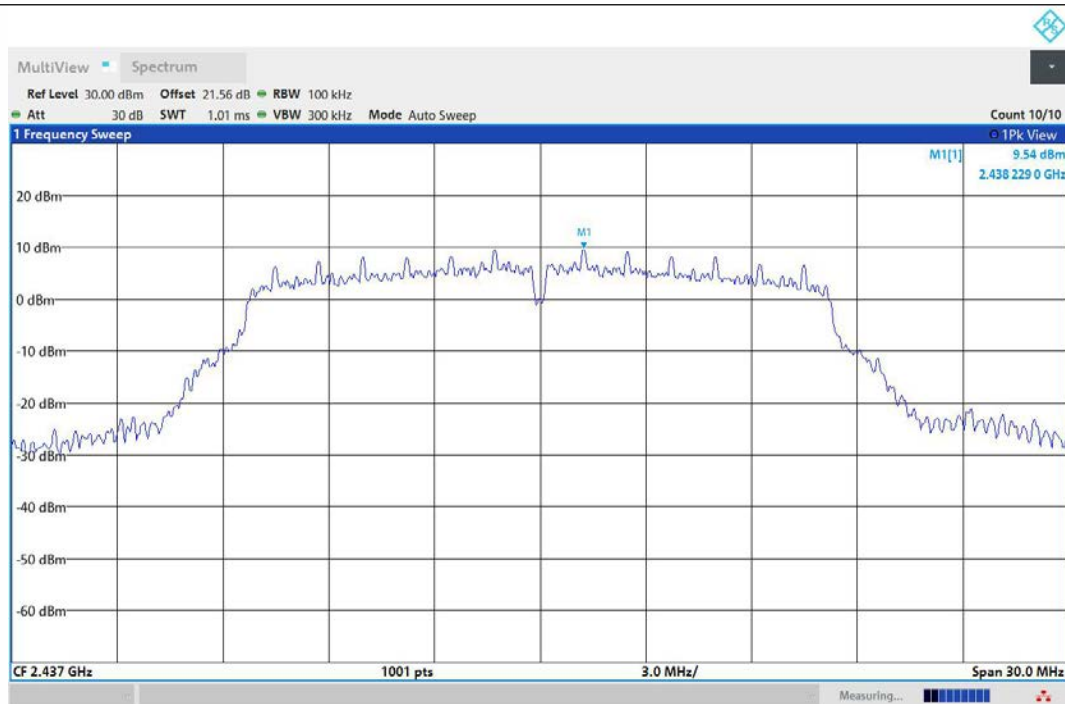
11G-Ant2-2412-30~1000-PASS



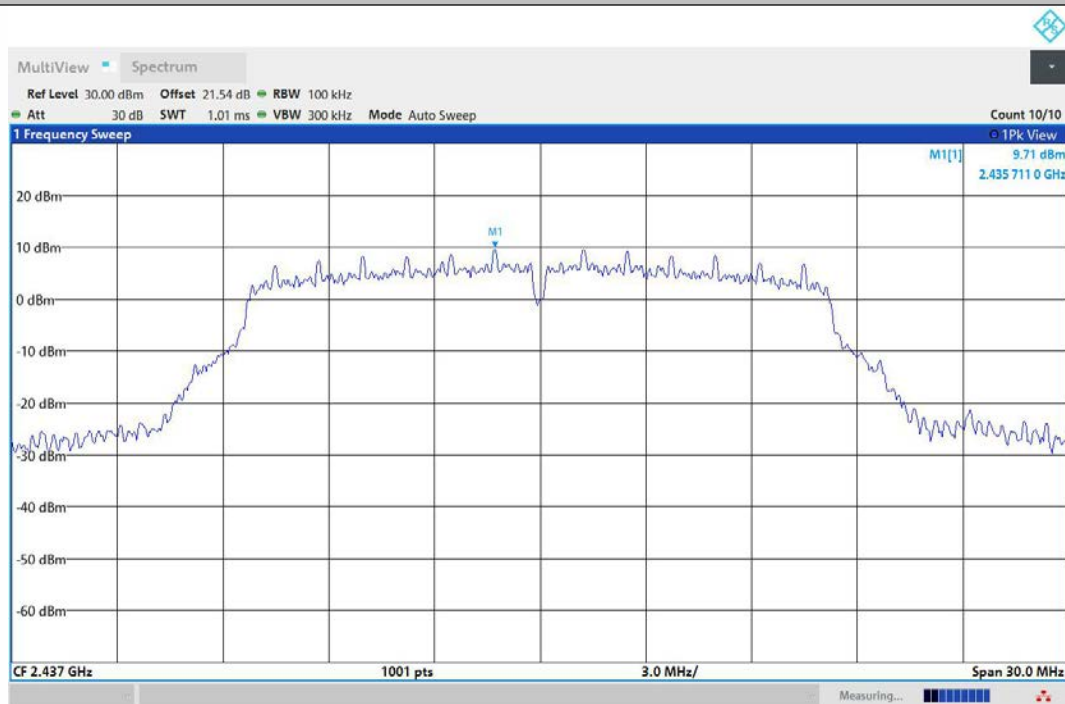
11G-Ant1-2412-1000~26500-PASS



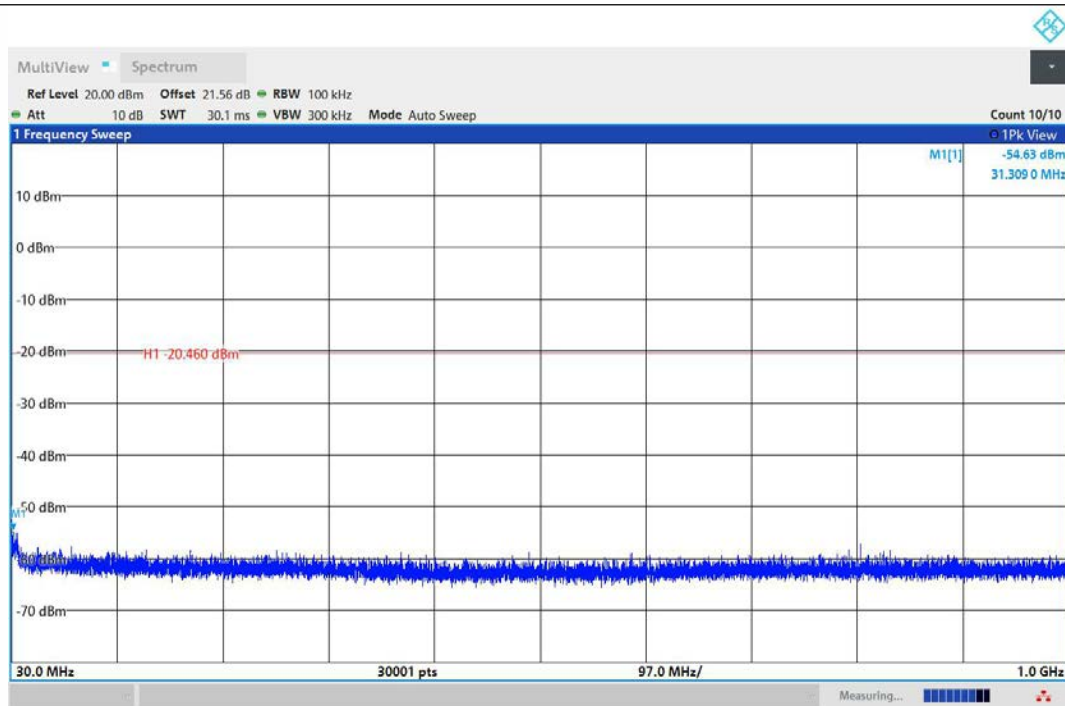
11G-Ant2-2412-1000~26500-PASS



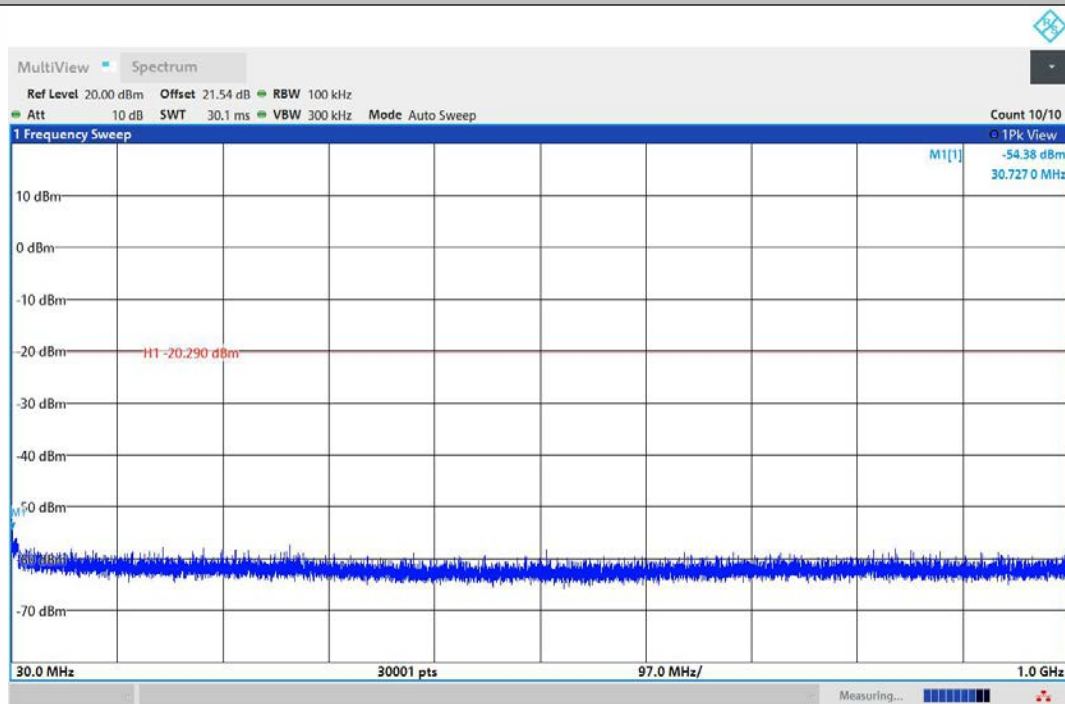
11G-Ant1-2437-0~Reference-PASS



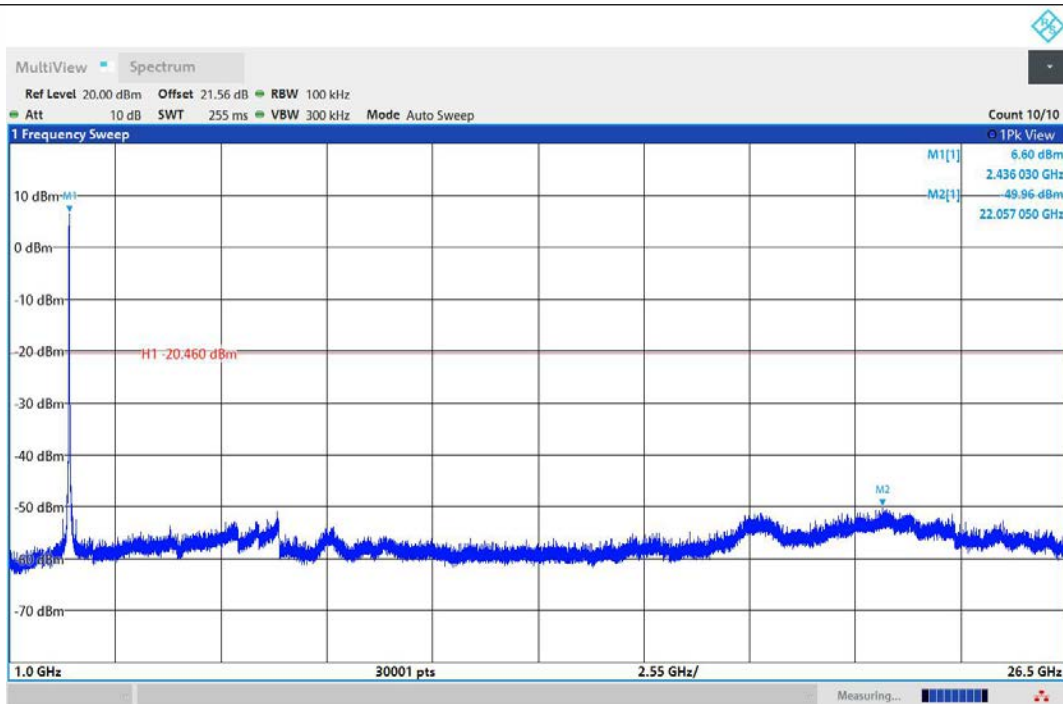
11G-Ant2-2437-0~Reference-PASS



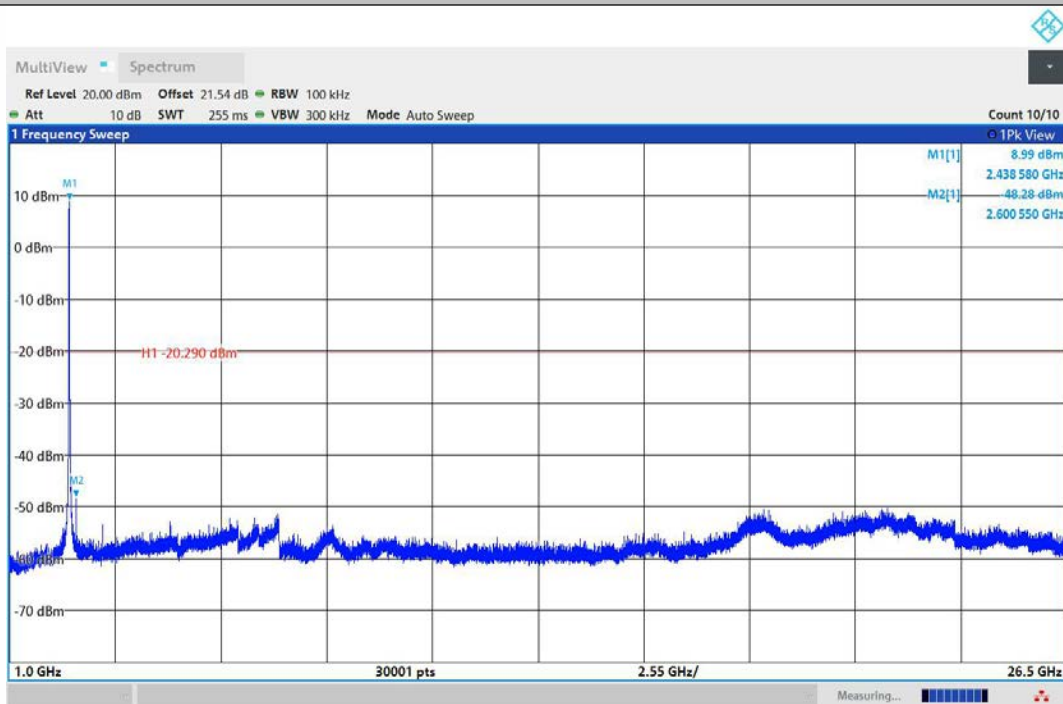
11G-Ant1-2437-30~1000-PASS



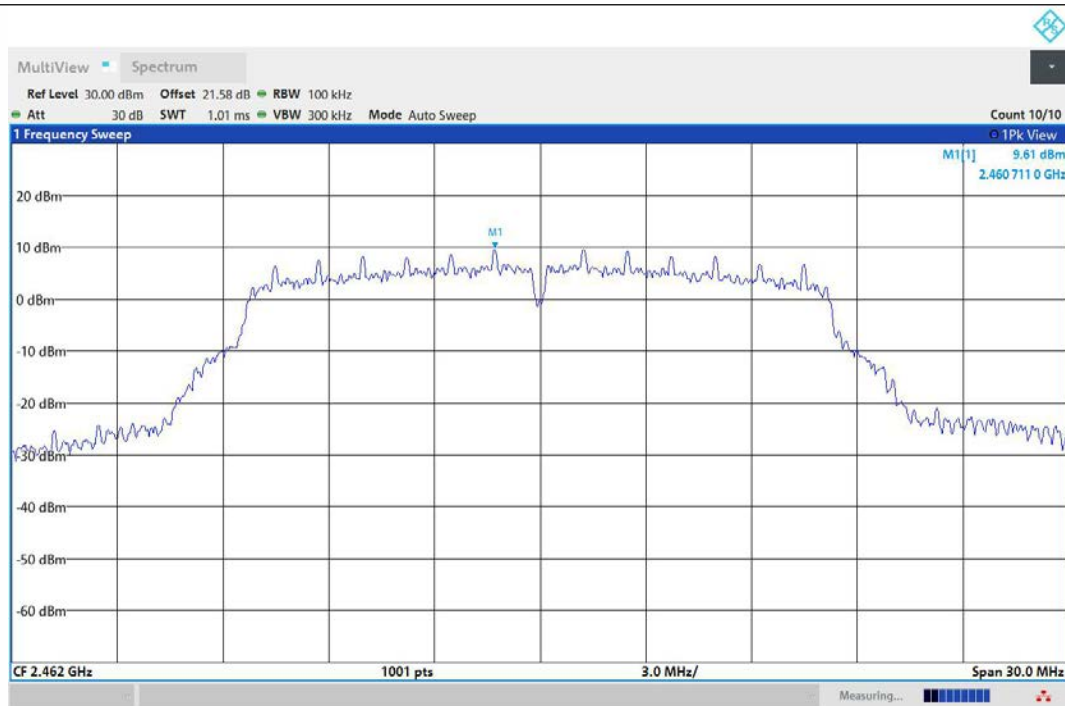
11G-Ant2-2437-30~1000-PASS



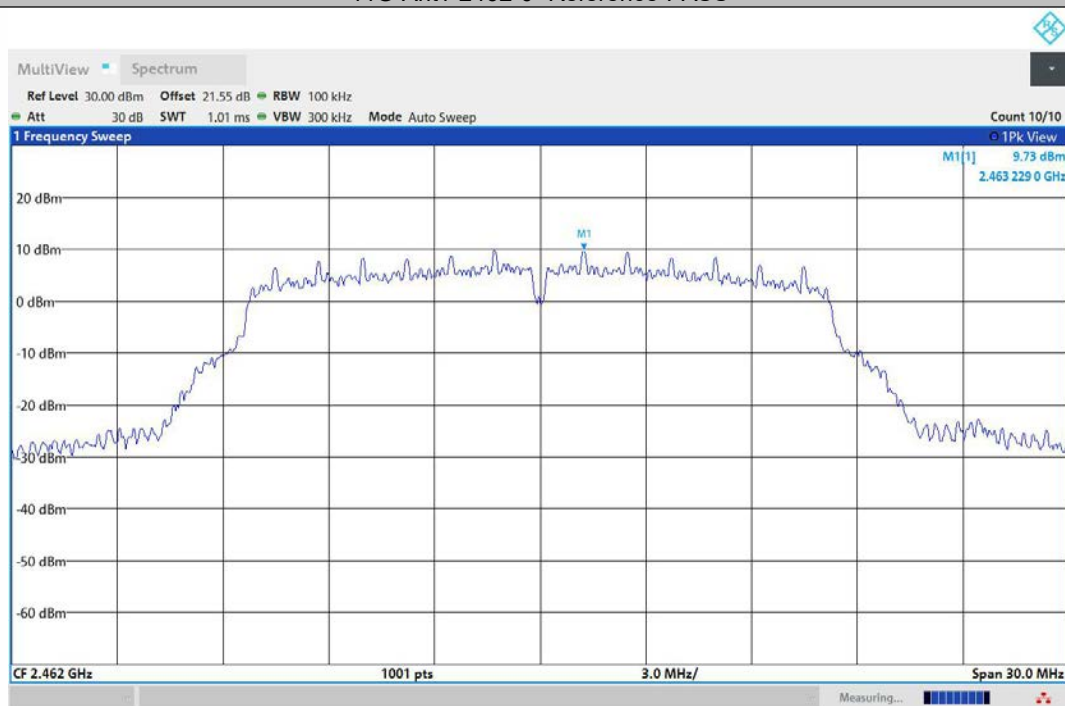
11G-Ant1-2437-1000~26500-PASS



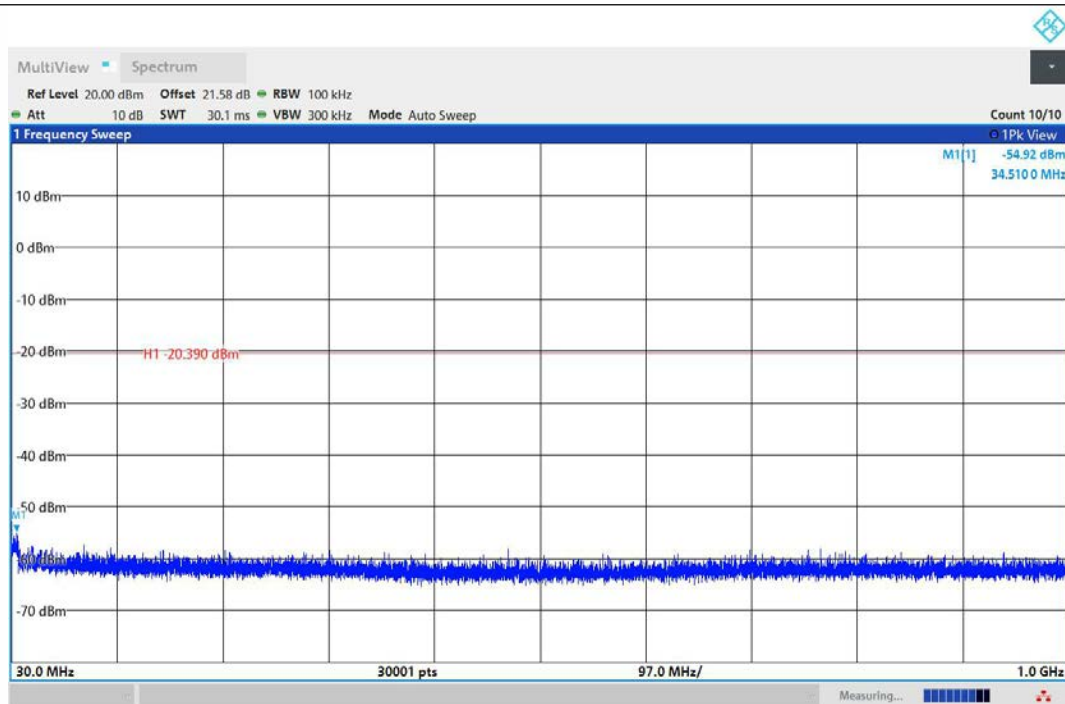
11G-Ant2-2437-1000~26500-PASS



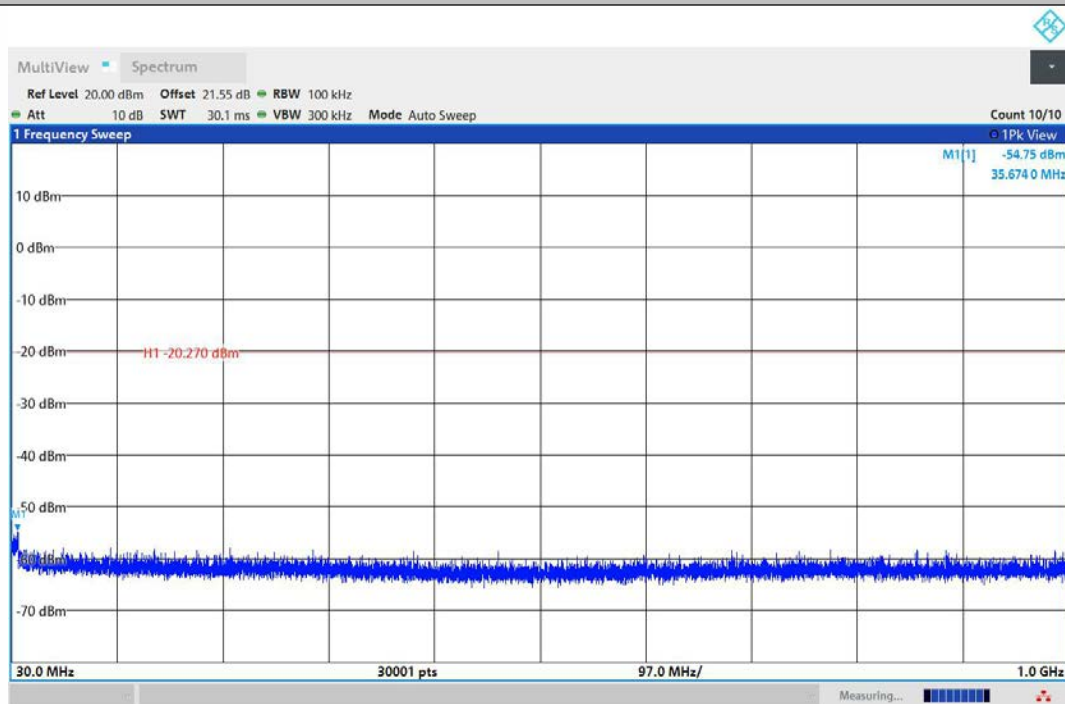
11G-Ant1-2462-0~Reference-PASS



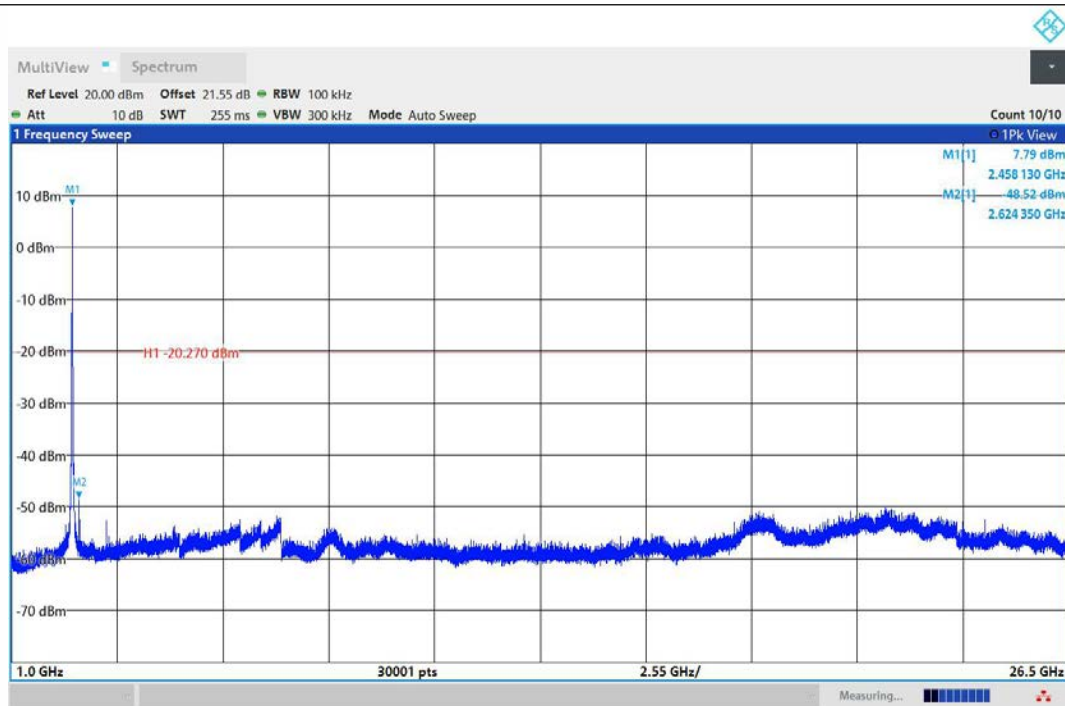
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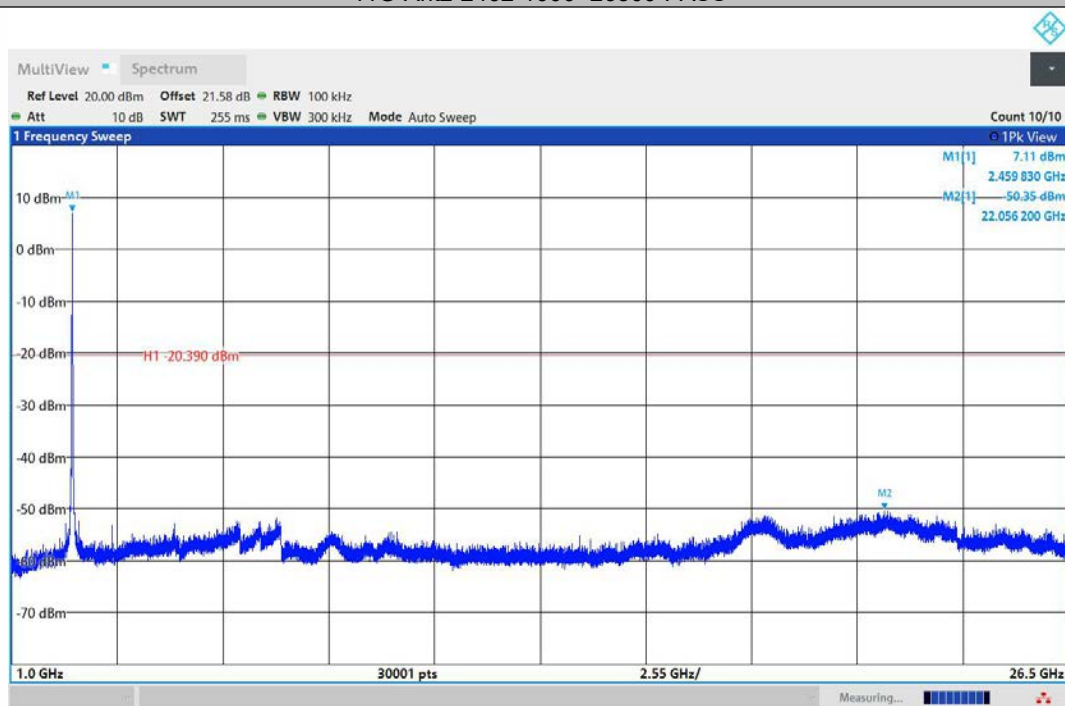
11G-Ant1-2462-30~1000-PASS



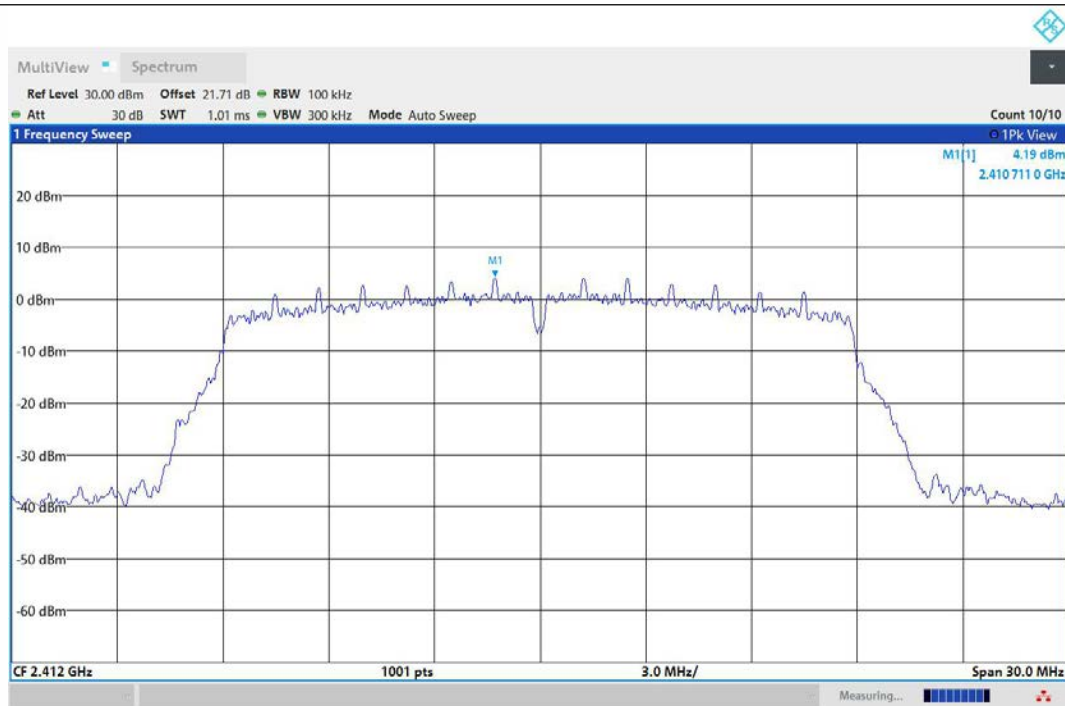
11G-Ant2-2462-30~1000-PASS



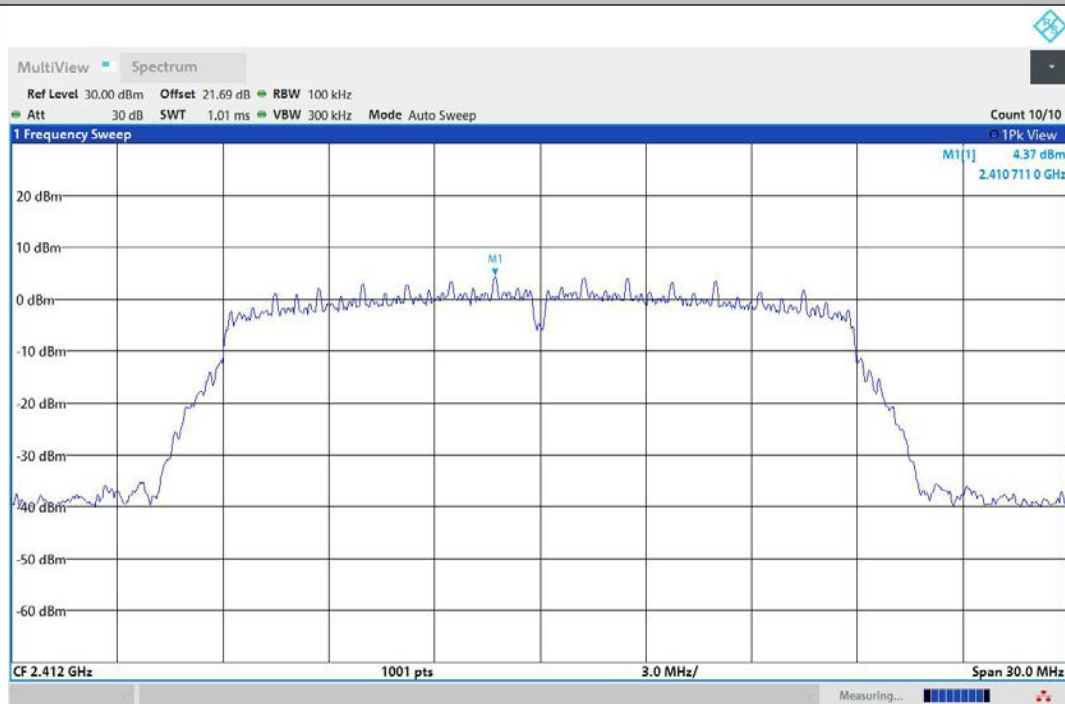
11G-Ant2-2462-1000~26500-PASS



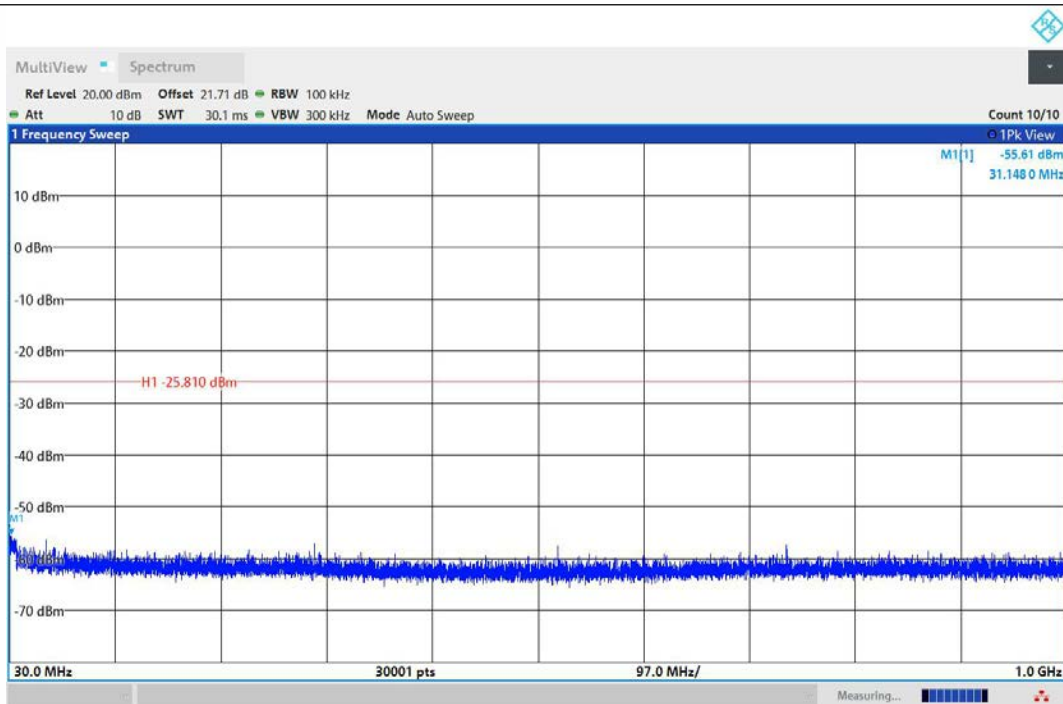
11G-Ant1-2462-1000~26500-PASS



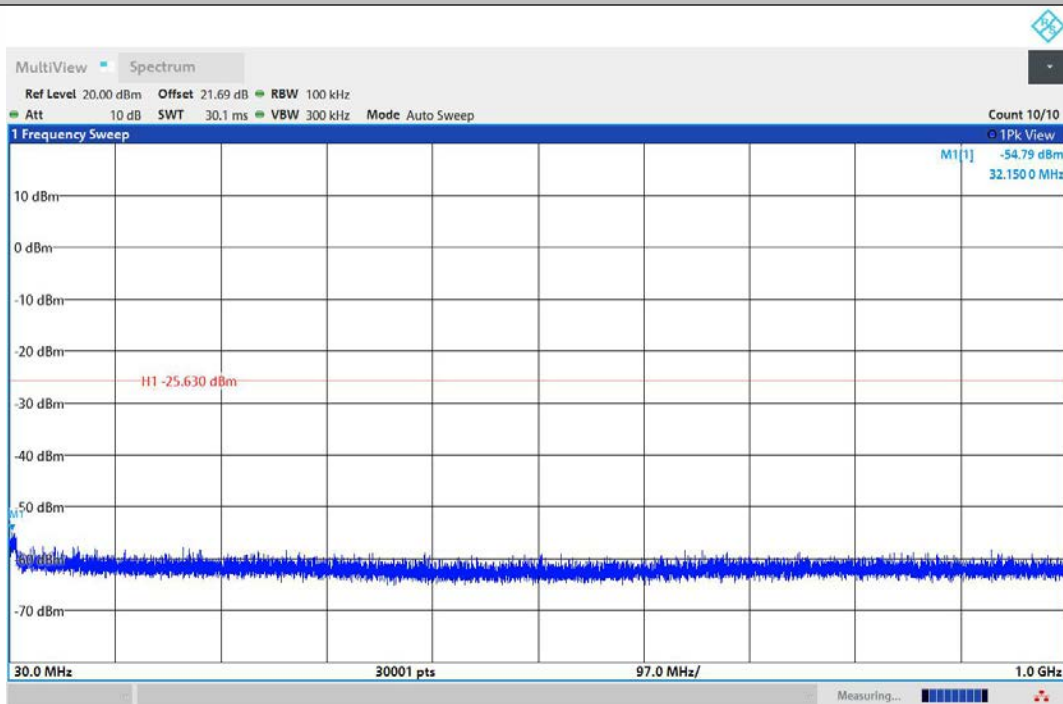
11N20MIMO-Ant1-2412-0~Reference-PASS



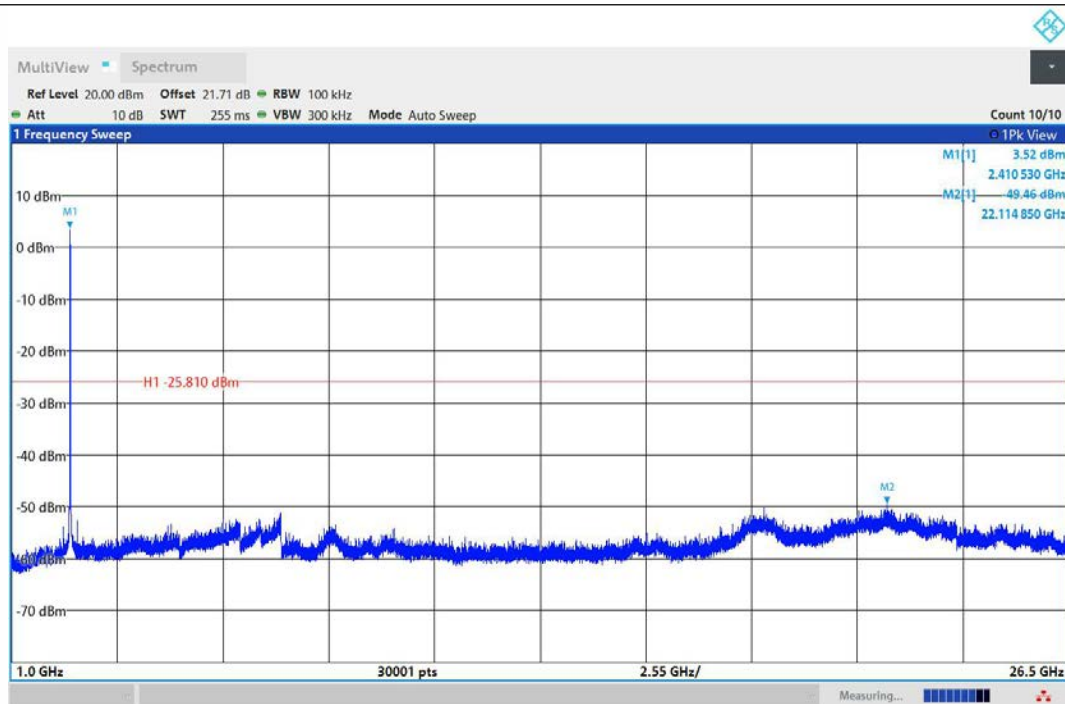
11N20MIMO-Ant2-2412-0~Reference-PASS



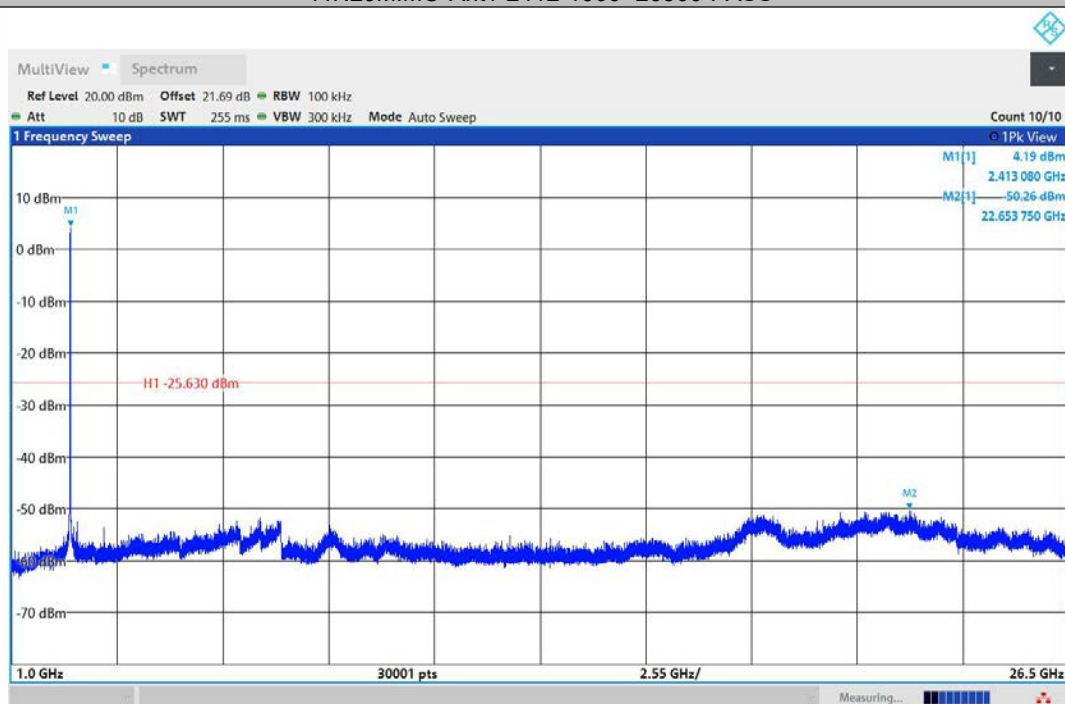
11N20MIMO-Ant1-2412-30~1000-PASS



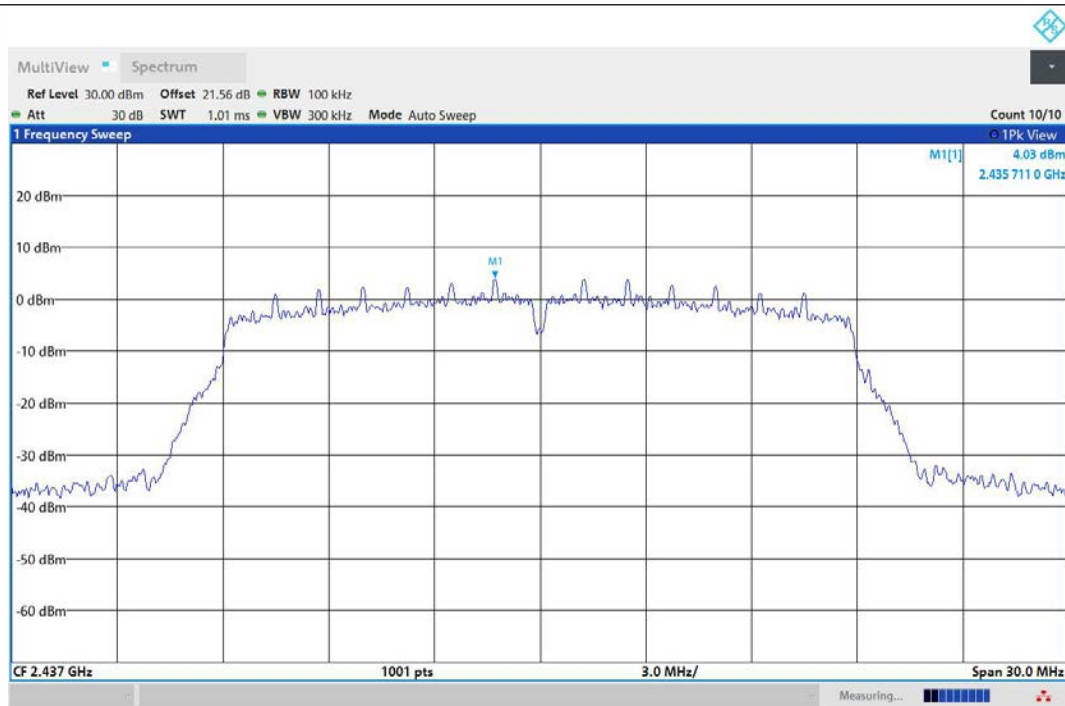
11N20MIMO-Ant2-2412-30~1000-PASS



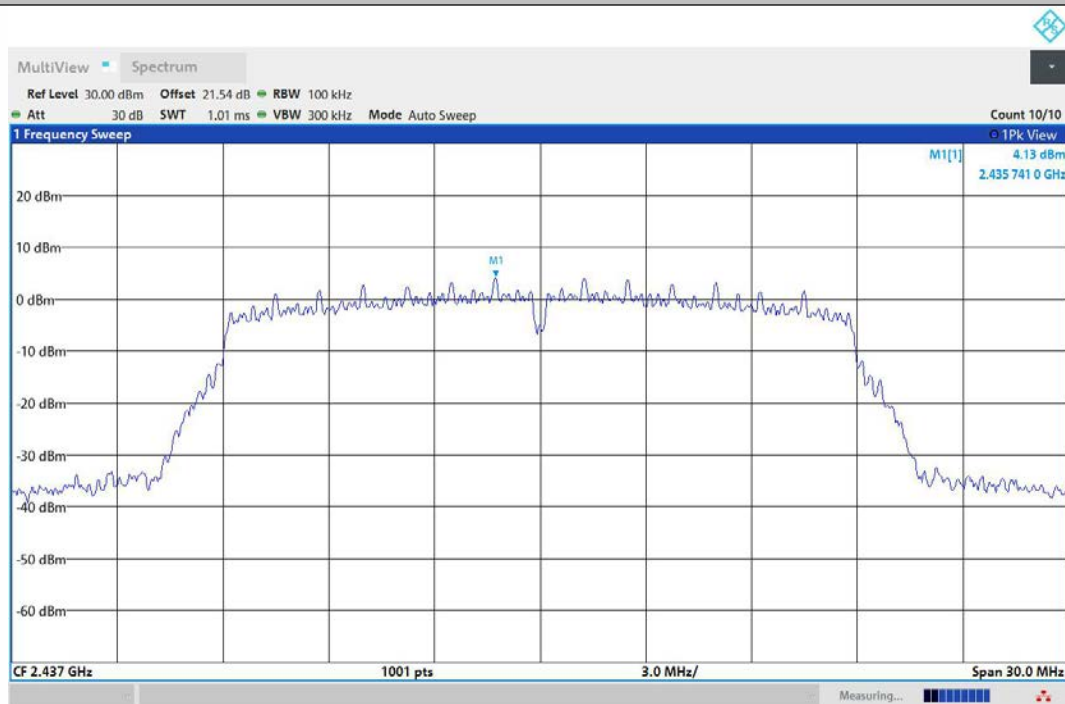
11N20MIMO-Ant1-2412-1000~26500-PASS



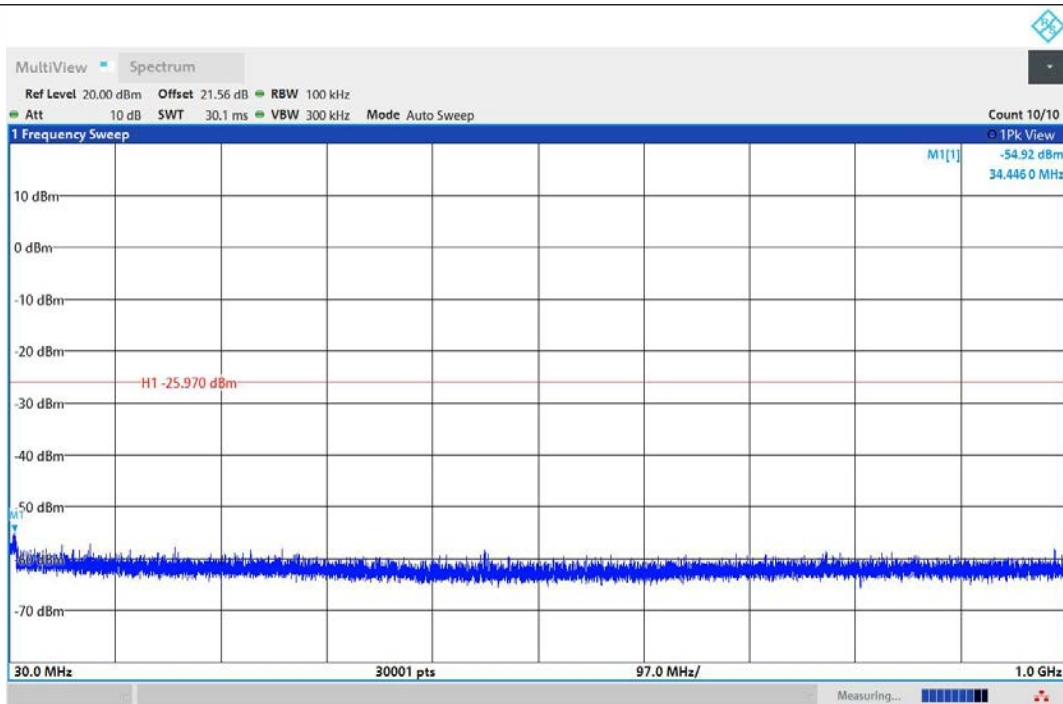
11N20MIMO-Ant2-2412-1000~26500-PASS



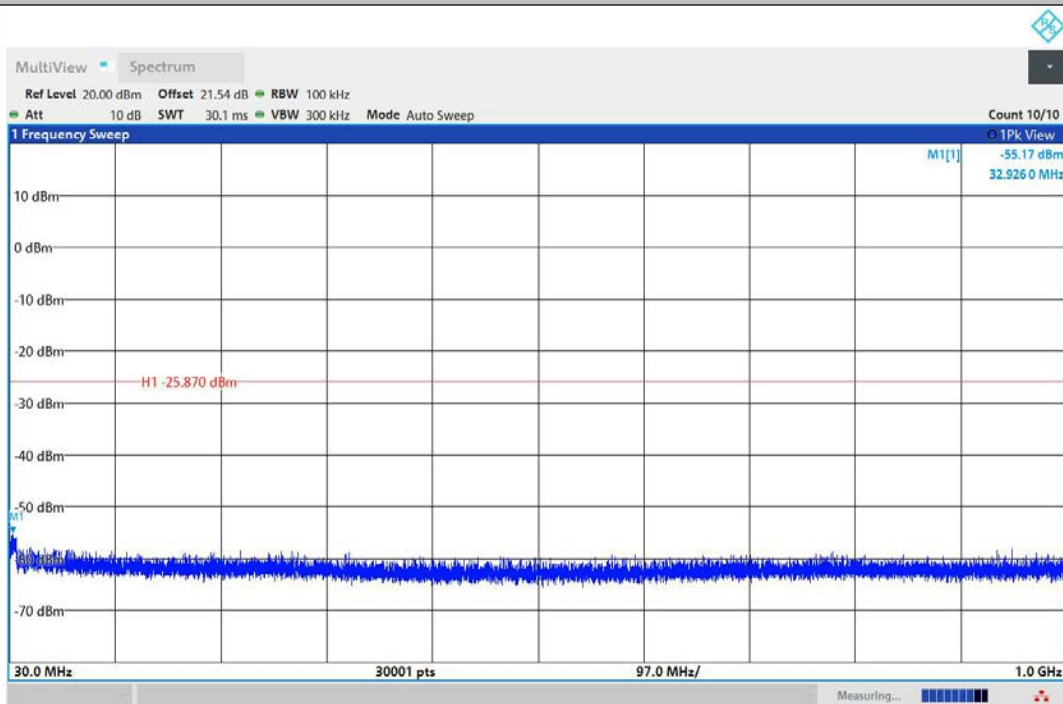
11N20MIMO-Ant1-2437-0~Reference-PASS



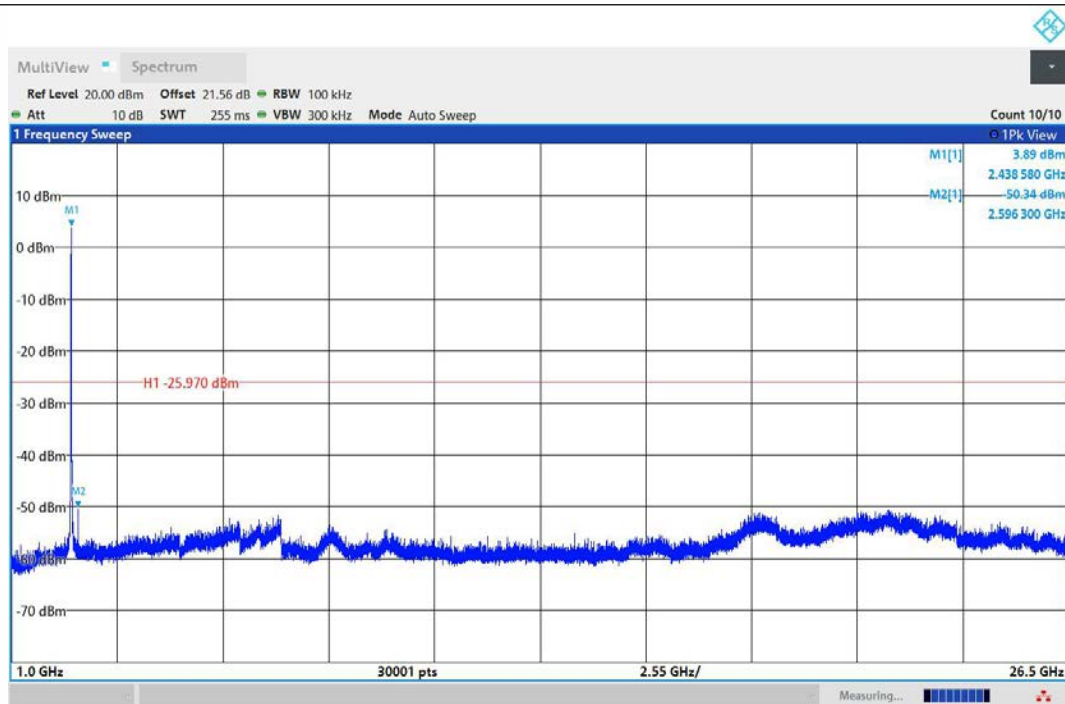
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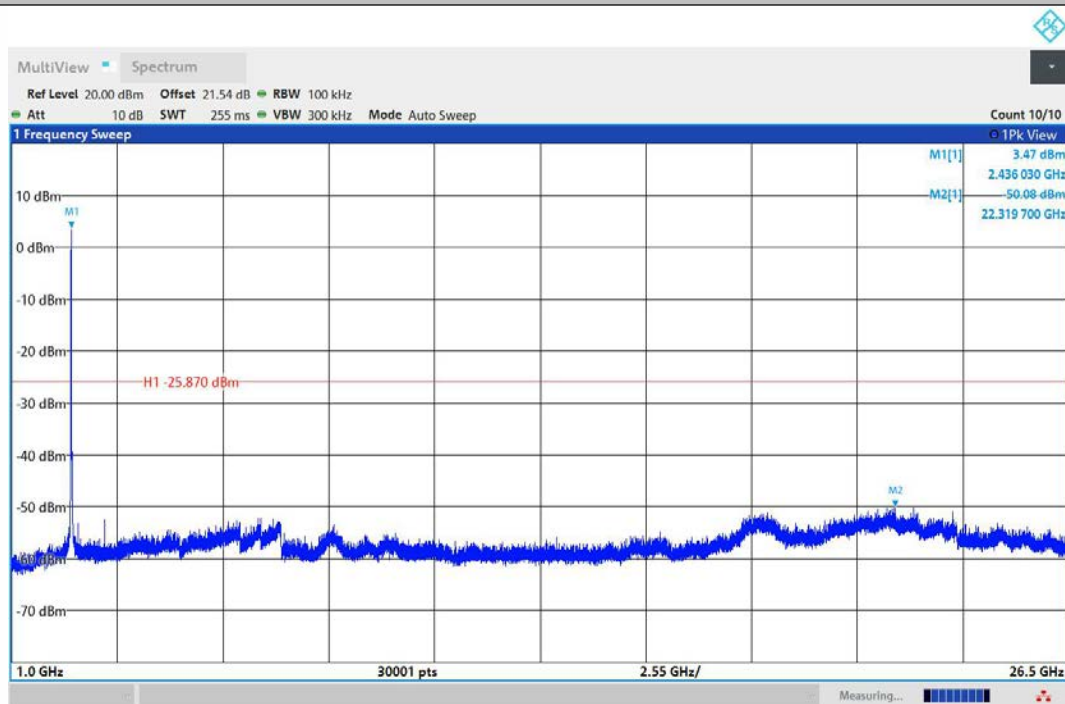
11N20MIMO-Ant1-2437-30~1000-PASS



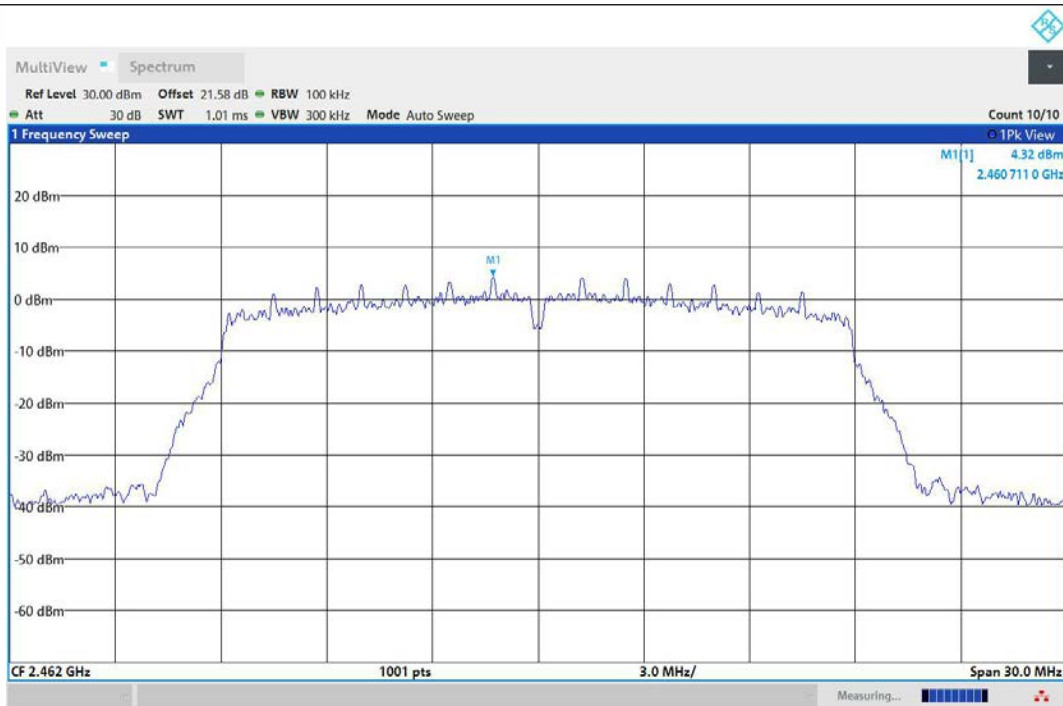
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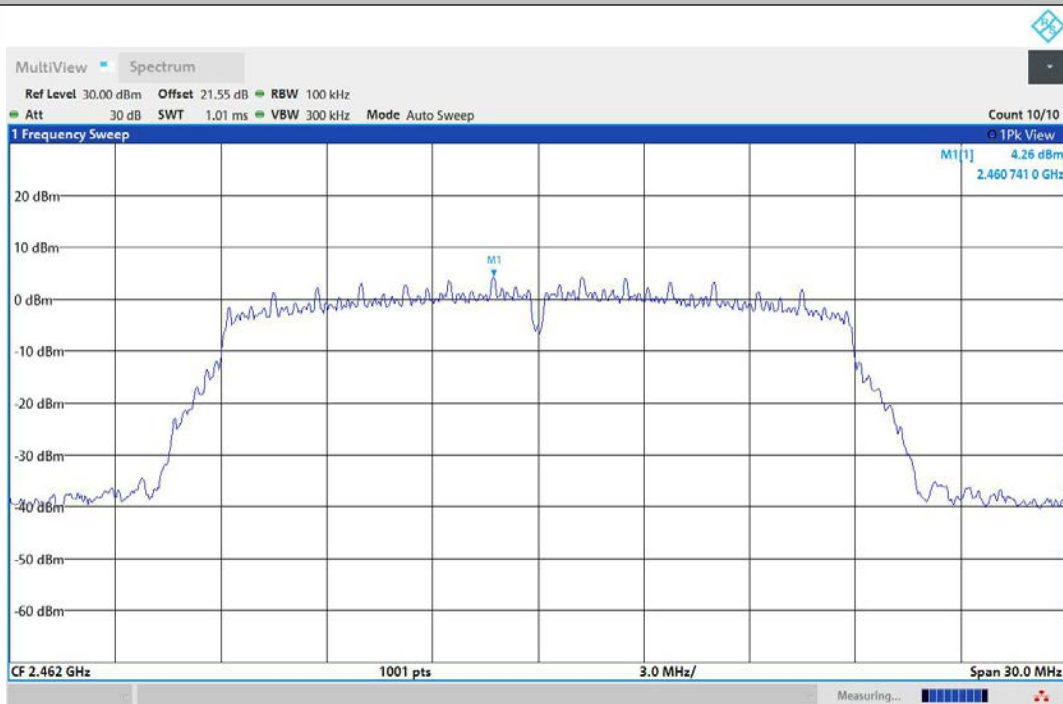
11N20MIMO-Ant1-2437-1000~26500-PASS



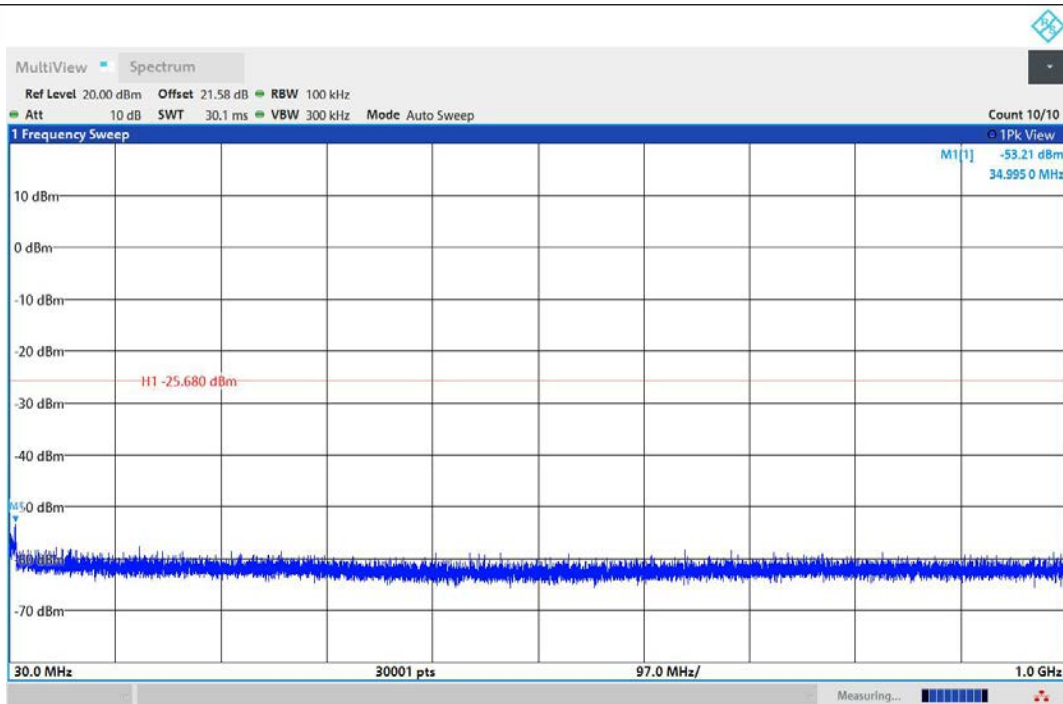
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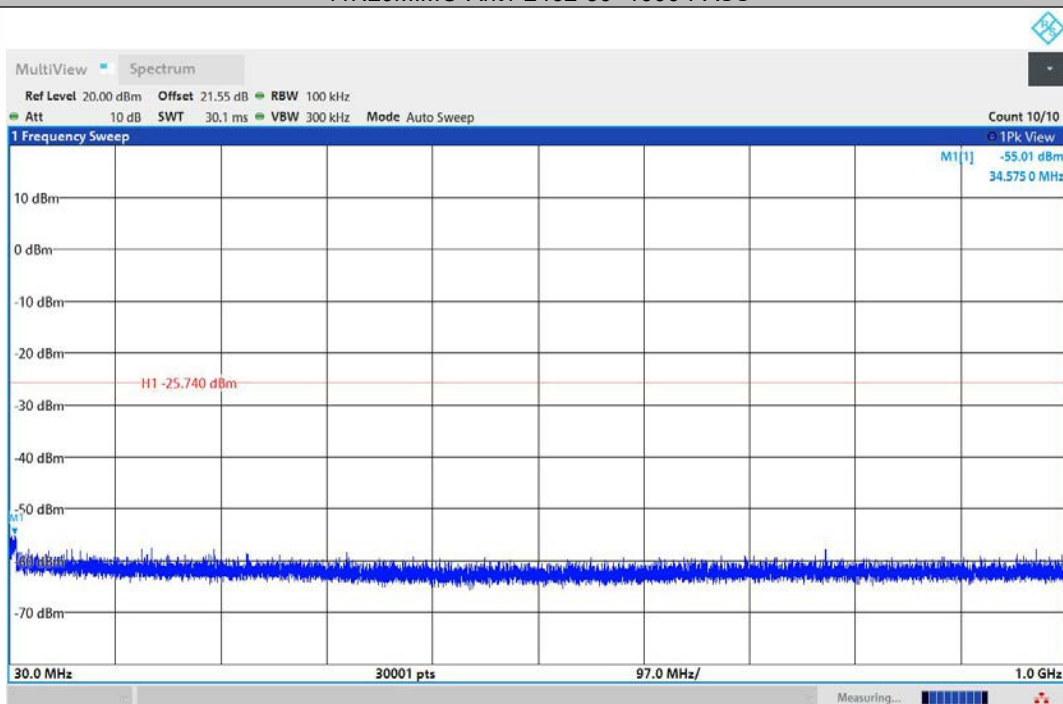
11N20MIMO-Ant1-2462-0~Reference-PASS



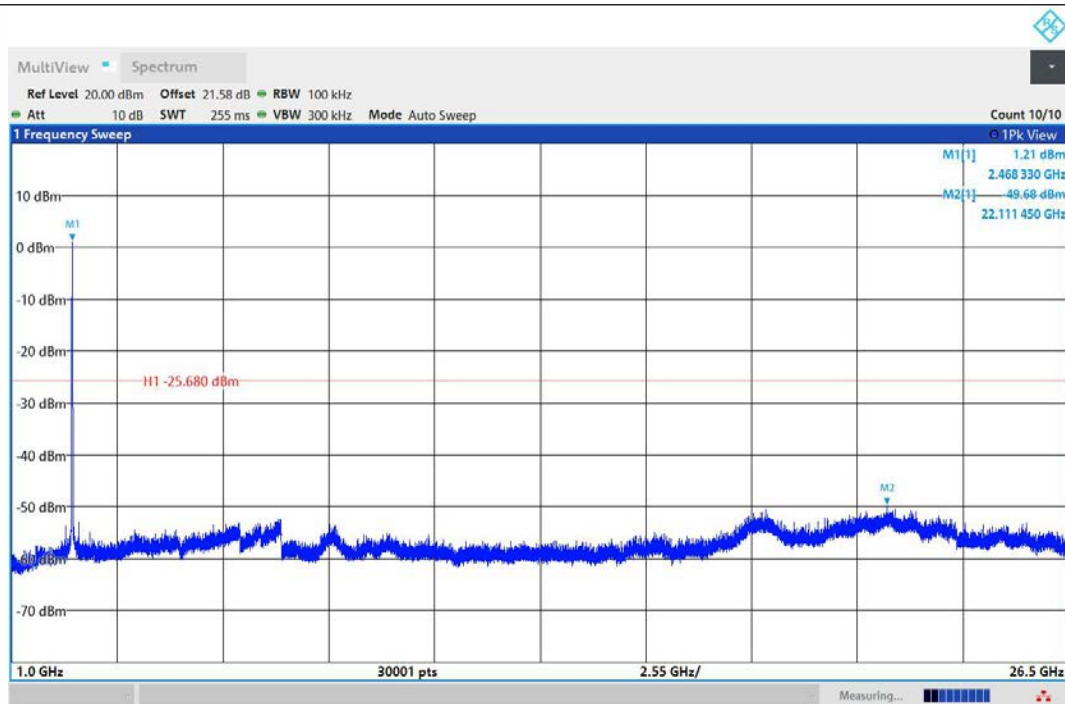
11N20MIMO-Ant2-2462-0~Reference-PASS



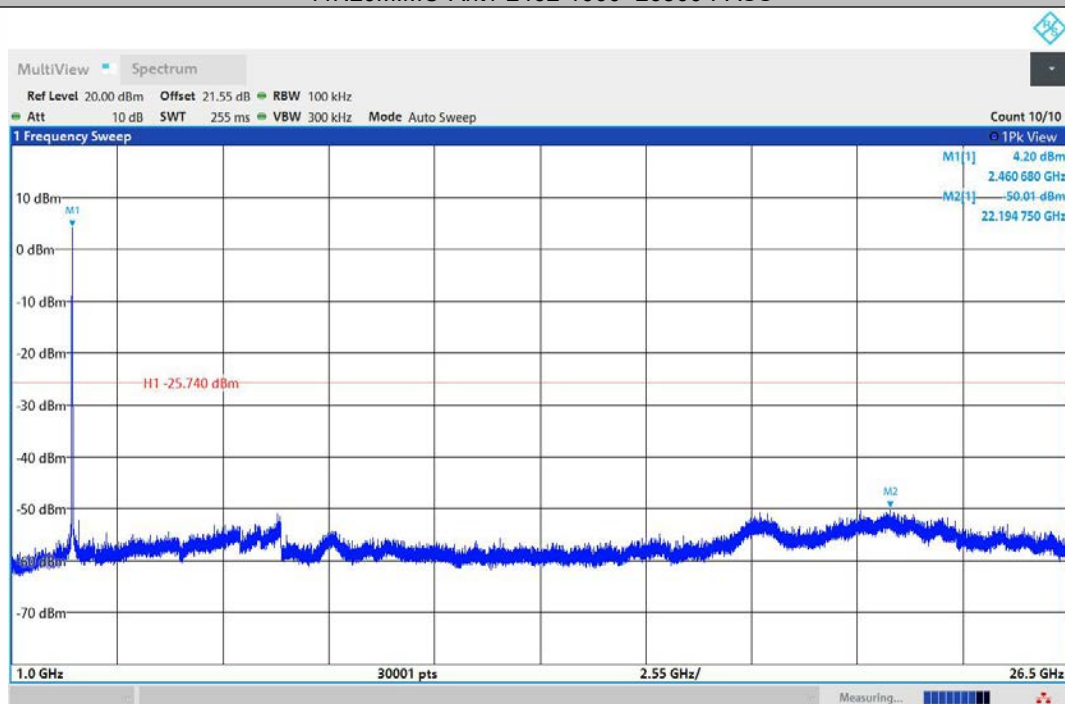
11N20MIMO-Ant1-2462-30~1000-PASS



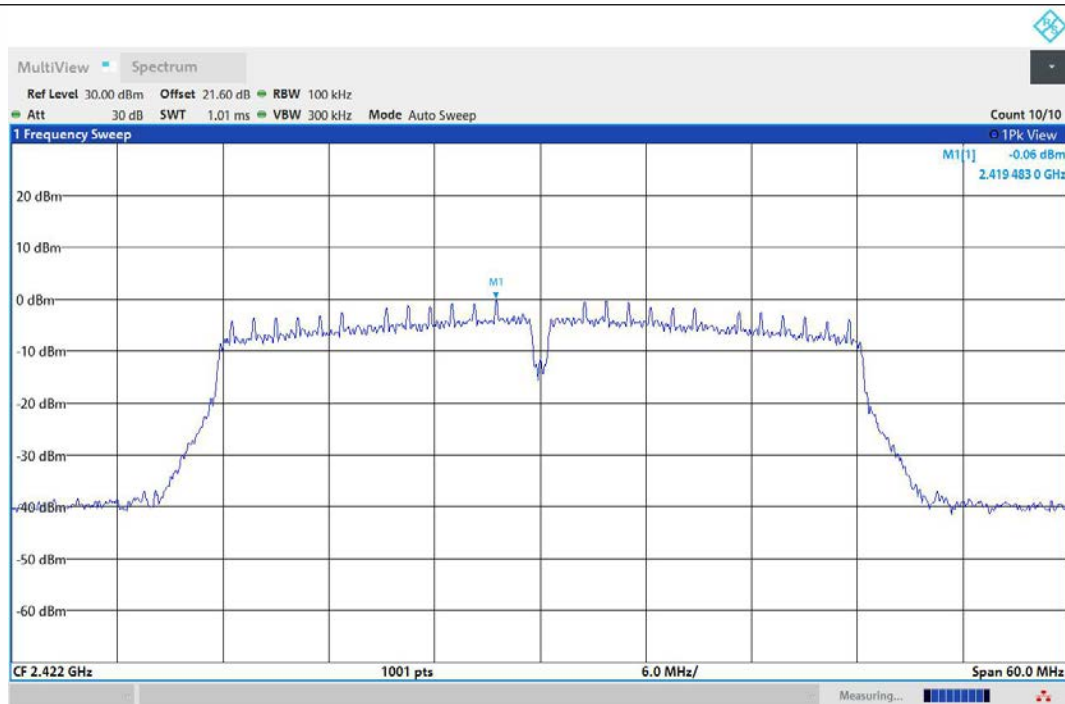
11N20MIMO-Ant2-2462-30~1000-PASS



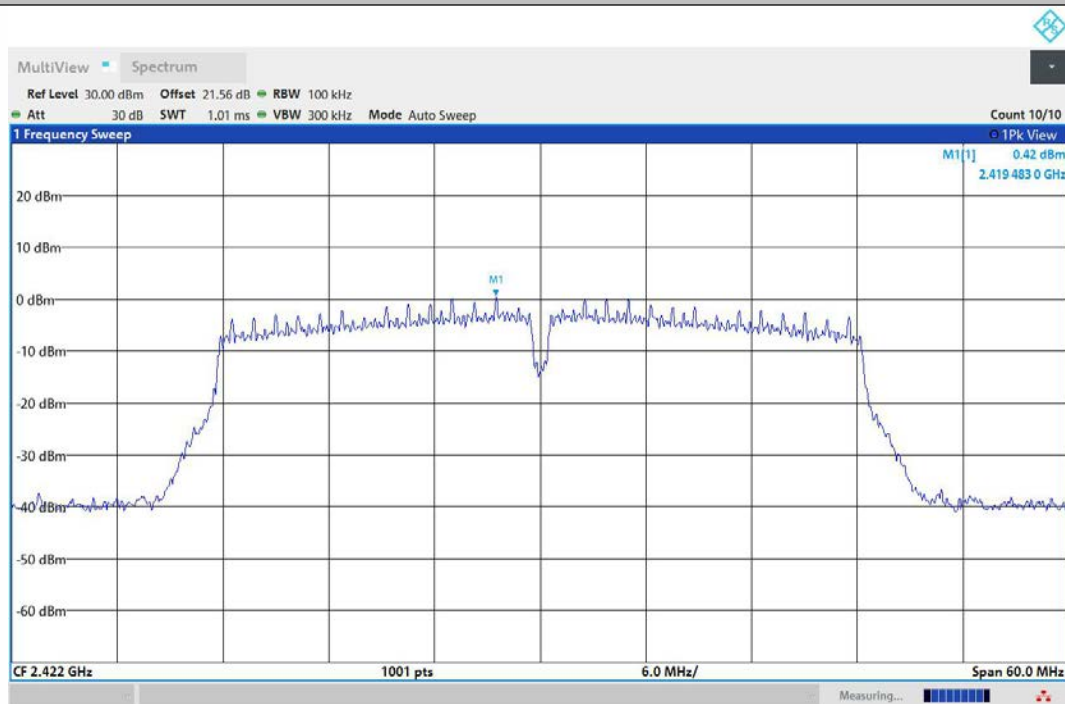
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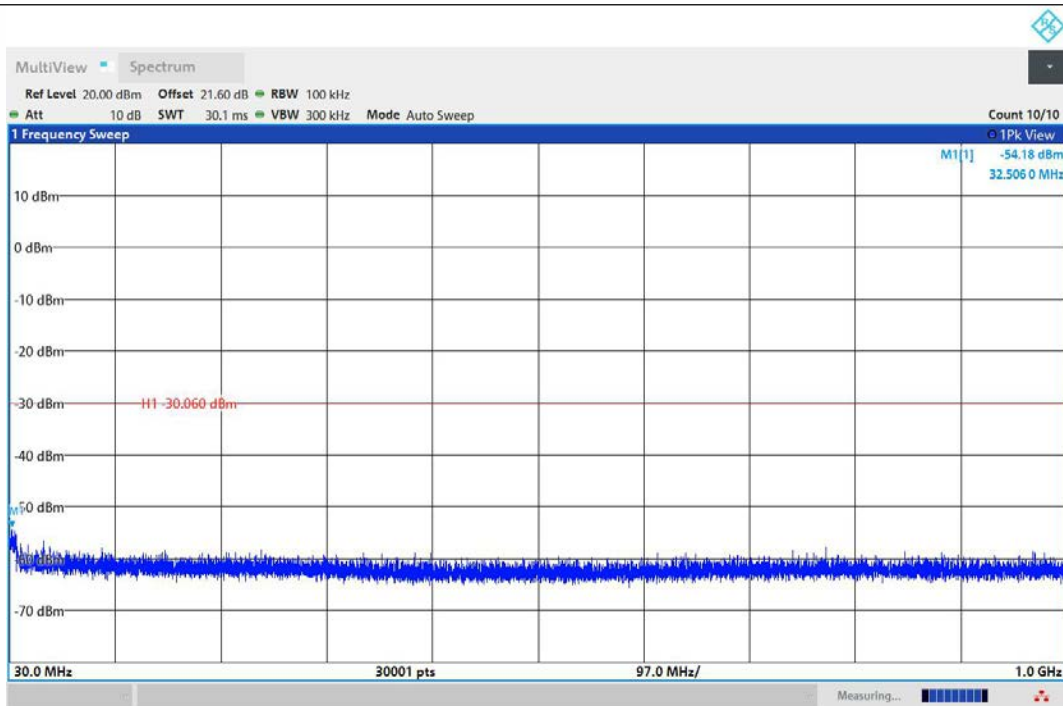
11N20MIMO-Ant2-2462-1000~26500-PASS



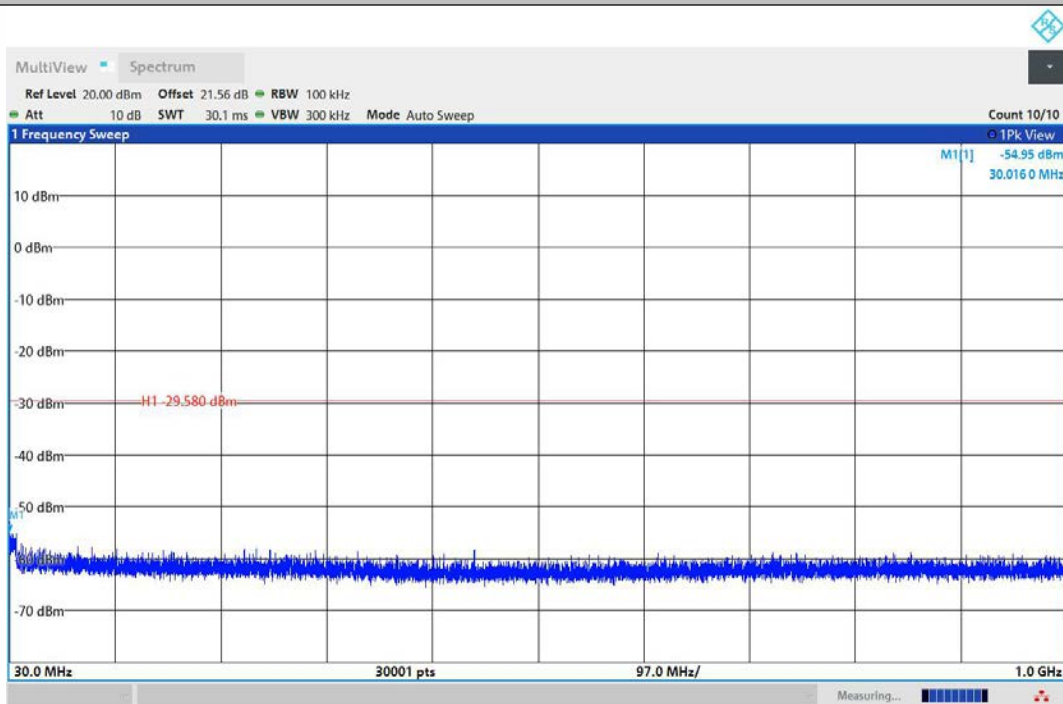
11N40MIMO-Ant1-2422-0~Reference-PASS



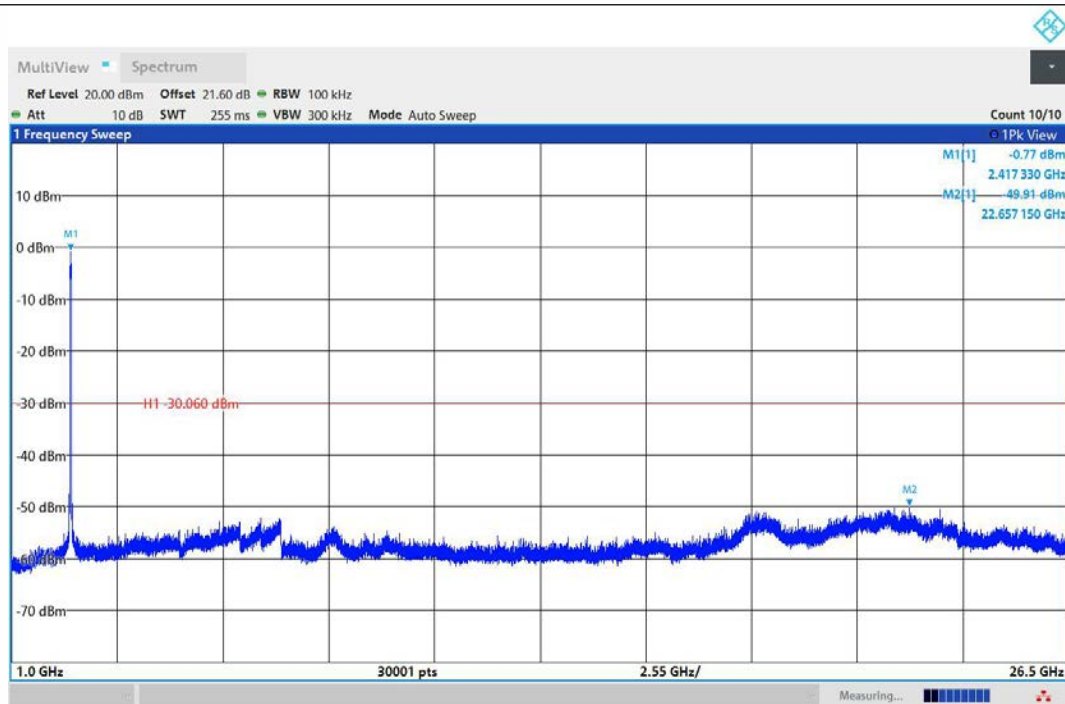
11N40MIMO-Ant2-2422-0~Reference-PASS



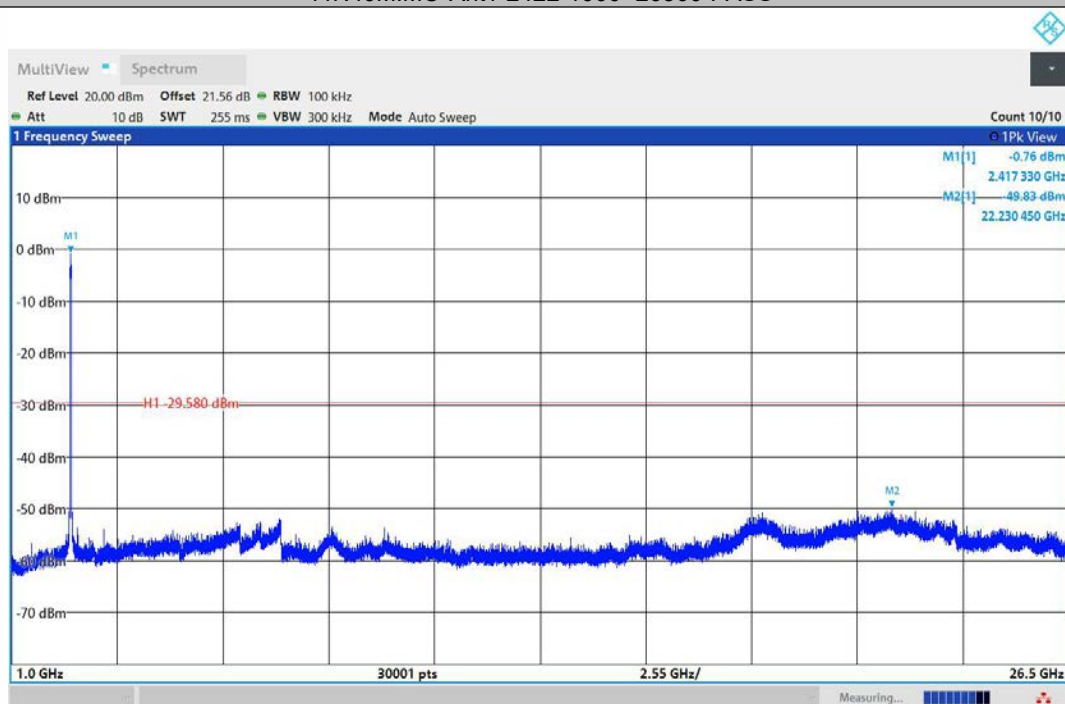
11N40MIMO-Ant1-2422-30~1000-PASS



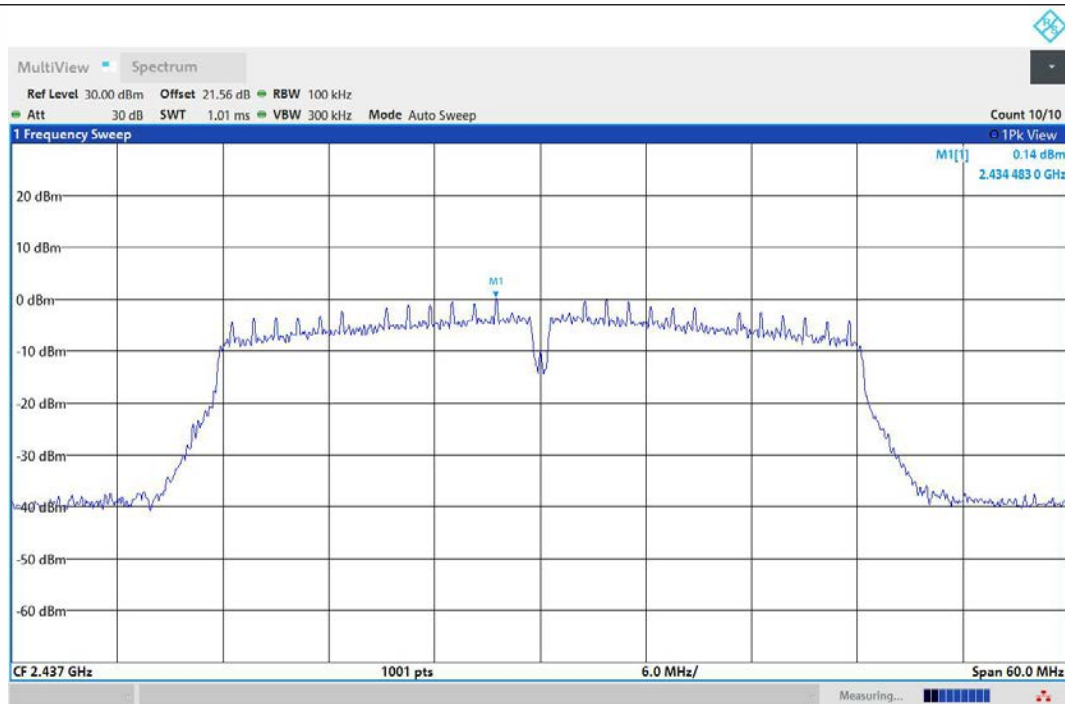
11N40MIMO-Ant2-2422-30~1000-PASS



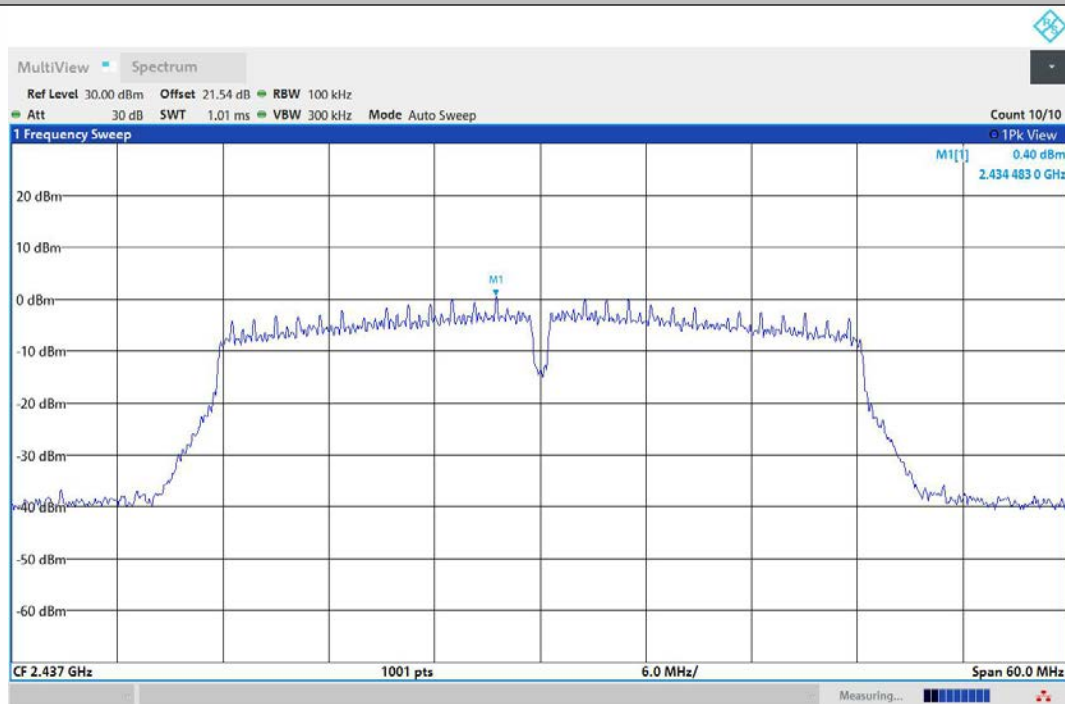
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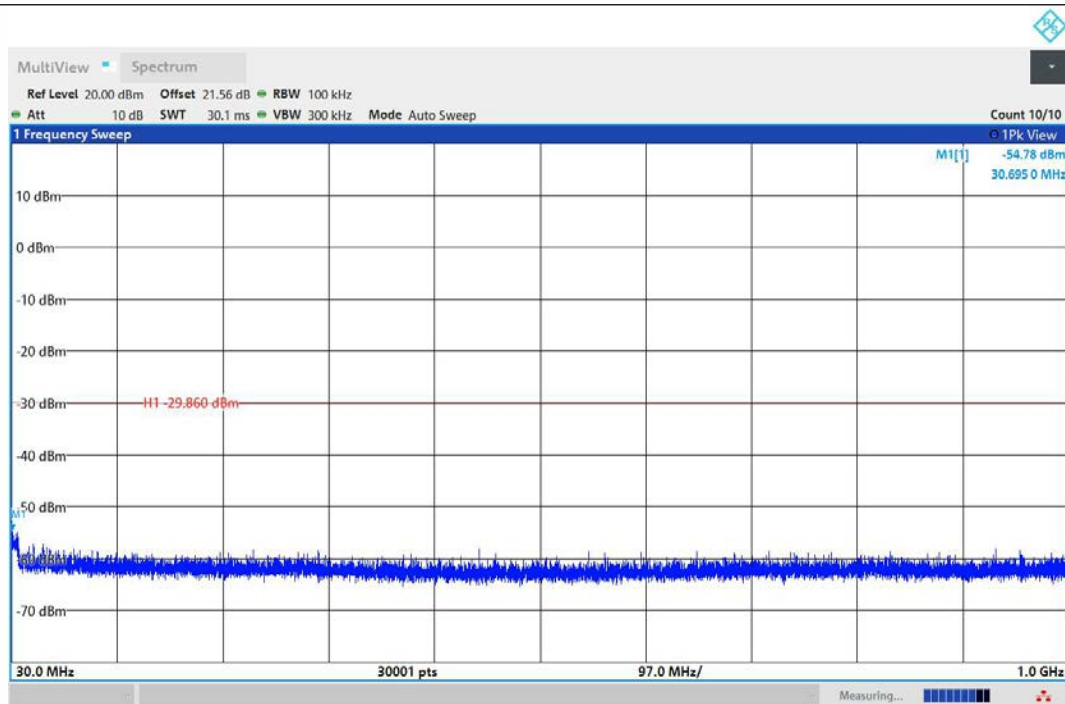
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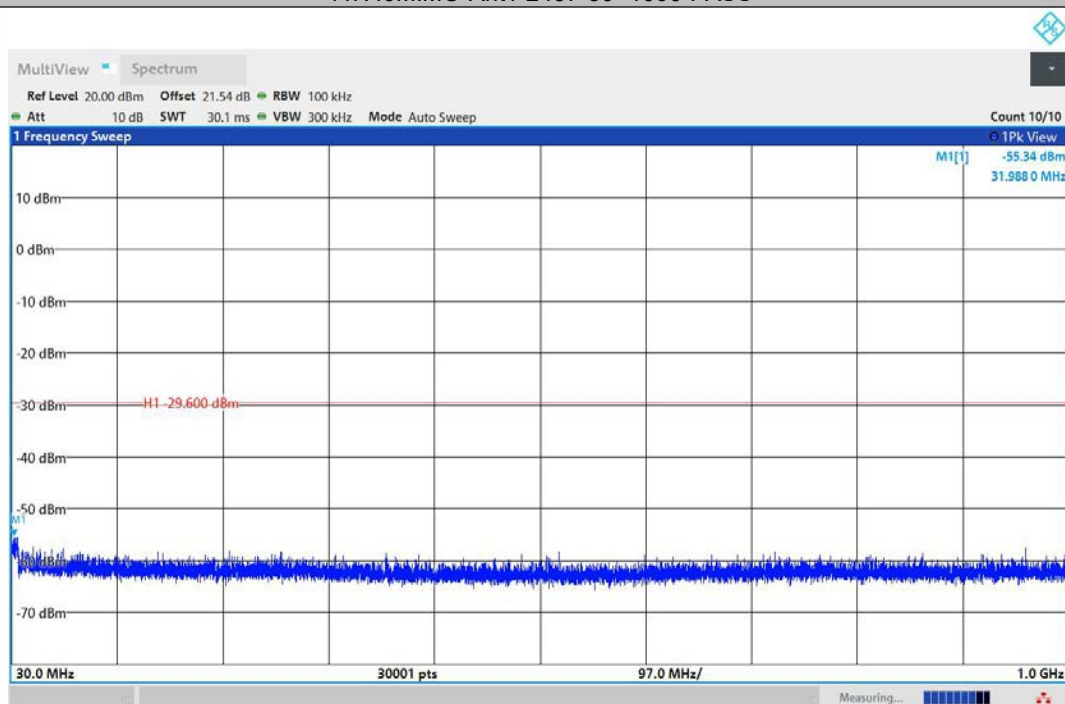
11N40MIMO-Ant1-2437-0~Reference-PASS



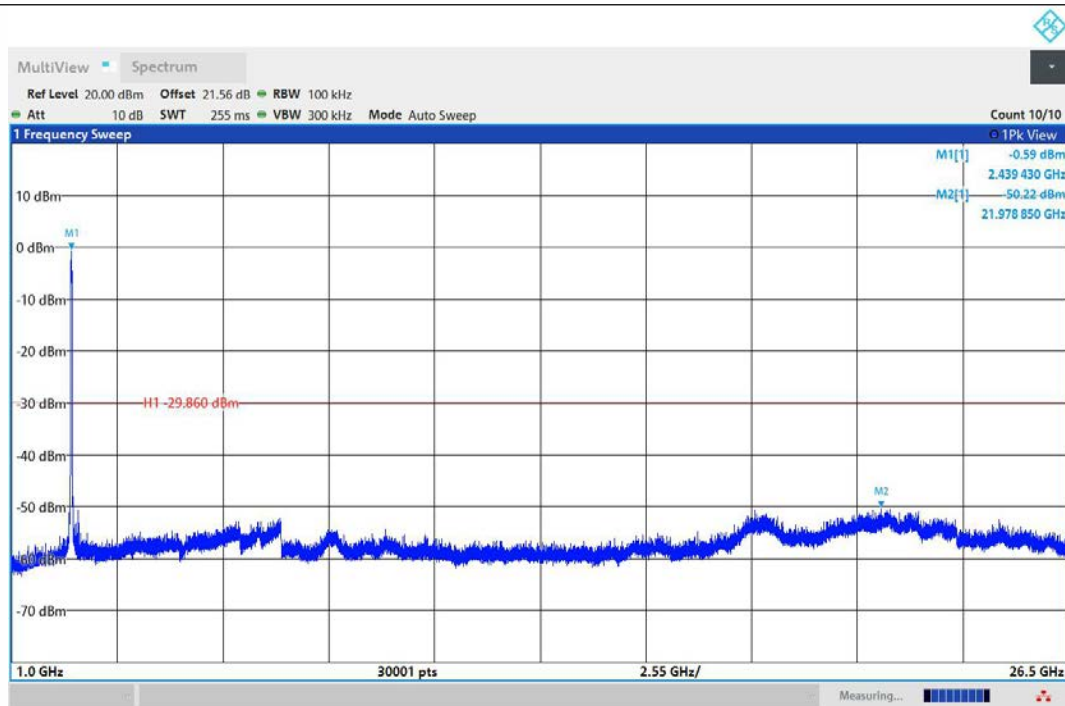
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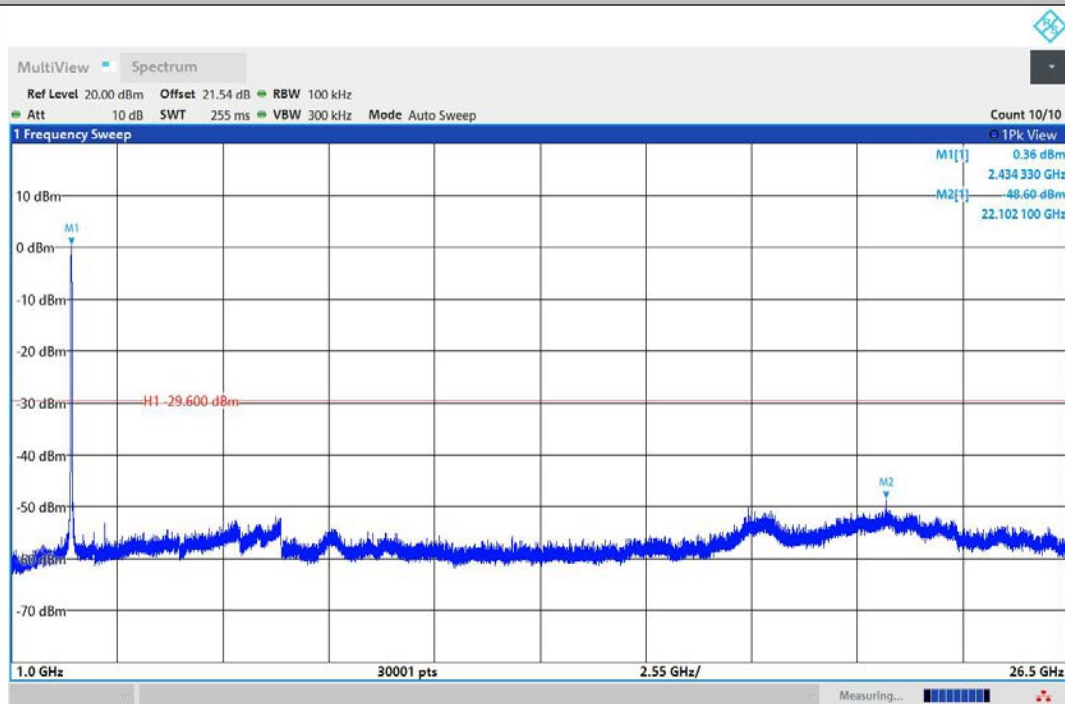
11N40MIMO-Ant1-2437-30~1000-PASS



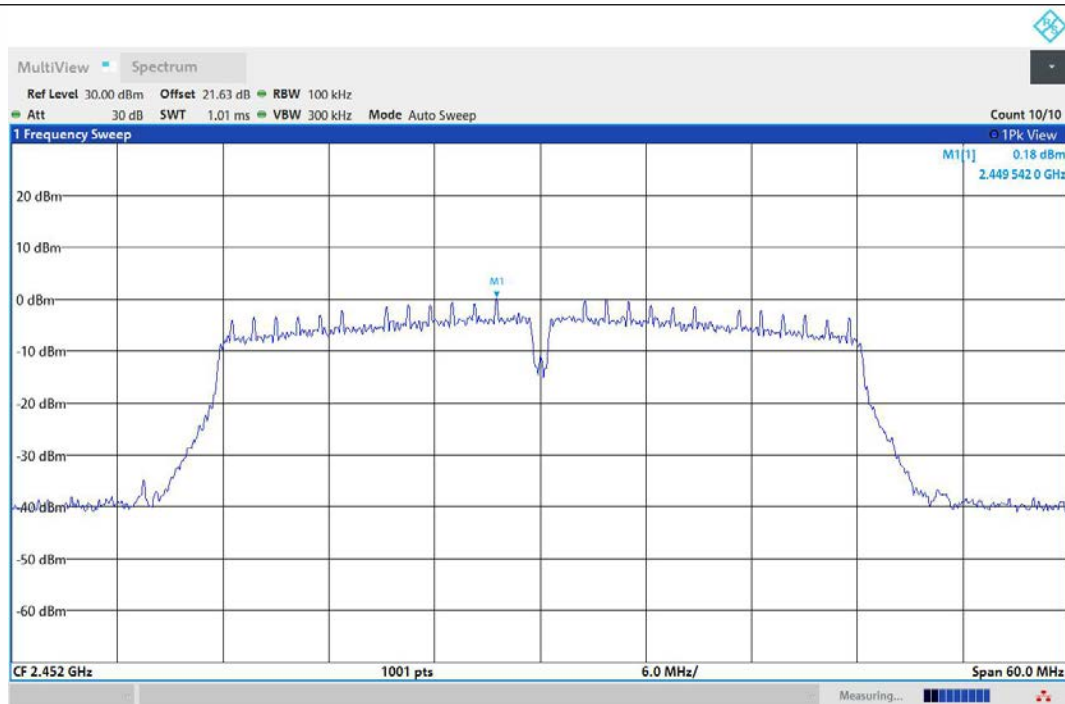
11N40MIMO-Ant2-2437-30~1000-PASS



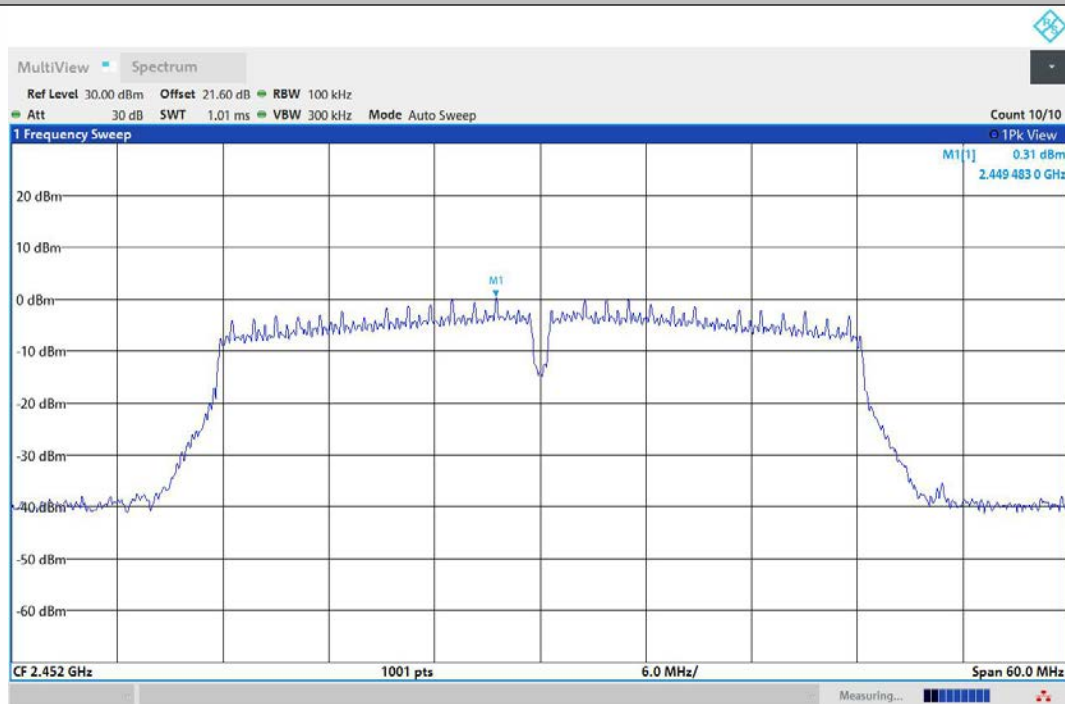
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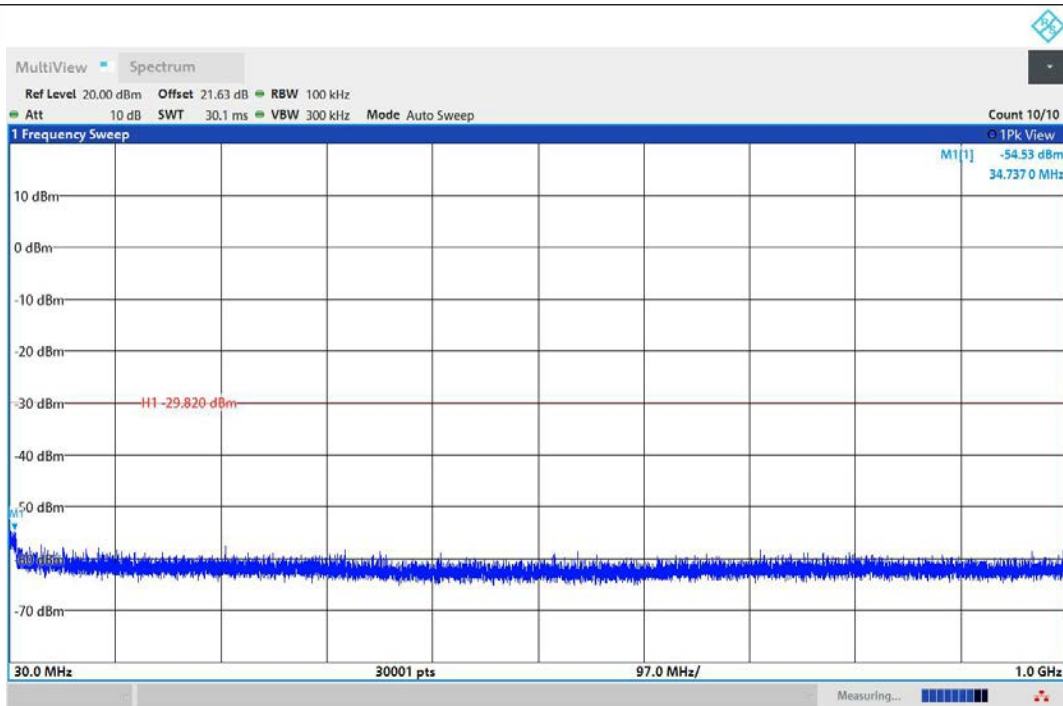
11N40MIMO-Ant2-2437-1000~26500-PASS



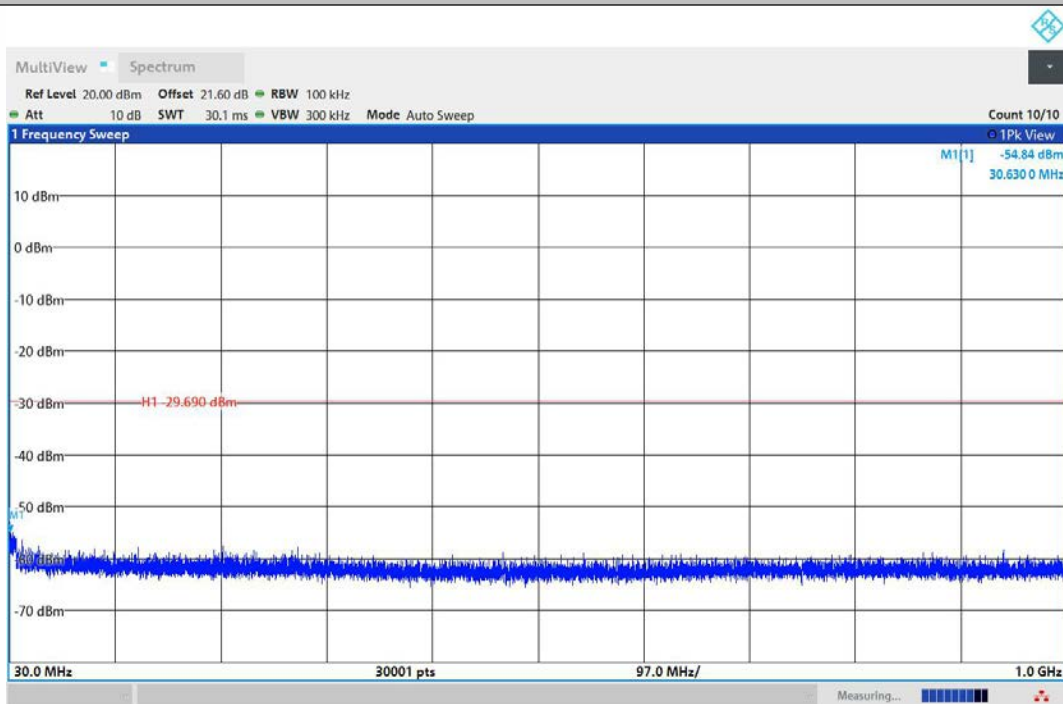
11N40MIMO-Ant1-2452-0~Reference-PASS



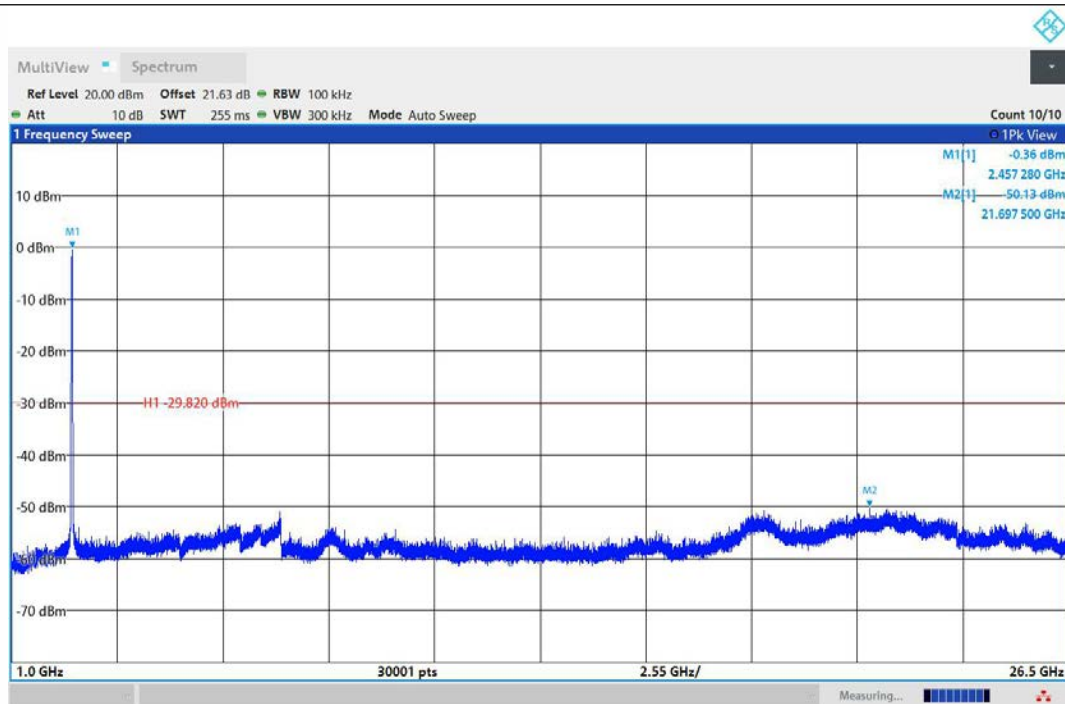
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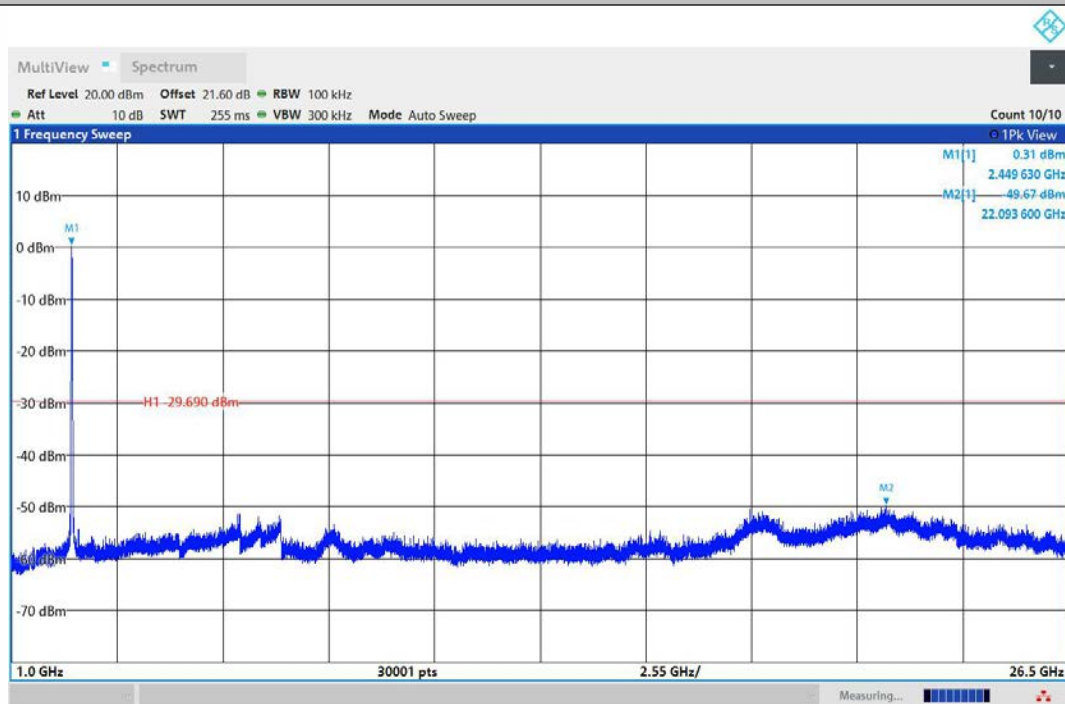
11N40MIMO-Ant1-2452-30~1000-PASS



11N40MIMO-Ant2-2452-30~1000-PASS



11N40MIMO-Ant1-2452-1000~26500-PASS



11N40MIMO-Ant2-2452-1000~26500-PASS

7.5 RADIATED EMISSION

7.5.1 Applicable Standard

According to FCC Part 15.247(d) and 15.209 and KDB 558074 D01 15.247 Meas Guidance v05r02.

7.5.2 Conformance Limit

According to FCC Part 15.247(d): radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

According to FCC Part 15.205, Restricted bands:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
10.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(2)
13.36-13.41			

According to FCC Part 15.205 the level of any transmitter spurious emission in Restricted bands shall not exceed the level of the emission specified in the following table.

Restricted Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/m)	Measurement Distance
0.009-0.490	2400/F(KHz)	20 log (uV/m)	300
0.490-1.705	24000/F(KHz)	20 log (uV/m)	30
1.705-30	30	29.5	30
30-88	100	40	3
88-216	150	43.5	3
216-960	200	46	3
Above 960	500	54	3

7.5.3 Test Configuration

Test according to clause 6.2 radio frequency test setup 2.

7.5.4 Test Procedure

This test is required for any spurious emission that falls in a Restricted Band, as defined in Section 15.205. It must be performed with the highest gain of each type of antenna proposed for use with the EUT. Use the following spectrum analyzer settings:

For Above 1GHz:

The EUT was placed on a turn table which is 1.5m above ground plane.

Maximum procedure was performed on the highest emissions to ensure EUT compliance.

Span = wide enough to fully capture the emission being measured.

RBW = 1 MHz.

VBW ≥ RBW.

Sweep = auto.

Detector function = peak.
Trace = max hold.

For Below 1GHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 100 kHz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

For Below 30MHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 9kHz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

For Below 150KHz:

The EUT was placed on a turn table which is 0.8m above ground plane.
Maximum procedure was performed on the highest emissions to ensure EUT compliance.
Span = wide enough to fully capture the emission being measured.
RBW = 200Hz.
VBW $\geq$ RBW.
Sweep = auto.
Detector function = peak.
Trace = max hold.

Follow the guidelines in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization, etc. A pre-amp and a high pass filter are required for this test, in order to provide the measuring system with sufficient sensitivity. Allow the trace to stabilize. The peak reading of the emission, after being corrected by the antenna factor, cable loss, pre-amp gain, etc., is the peak field strength, which must comply with the limit. Submit this data. Now set the VBW to 10 Hz, while maintaining all of the other instrument settings. This peak level, once corrected, must comply with the limit. If the dwell time per channel of the hopping signal is less than 100 ms, then the reading obtained with the 10 Hz VBW may be further adjusted by a "duty cycle correction factor", derived from $20\log(\text{dwell time}/100 \text{ ms})$, in an effort to demonstrate compliance with the limit. Submit this data.
Repeat above procedures until all frequency measured was complete.

7.5.5 Test Results

Temperature :	24.9°C	ATM Pressure:	1011 mbar
Humidity :	49 %	Test Engineer:	HZB

All of the configurations or modes are tested, the data of the worst case is recorded as below.

■ Spurious Emission below 30MHz(9KHz to 30MHz)

Temperature: 28.1℃ Test By: CZF
Humidity: 43%
Test mode: 802.11b

Freq. (MHz)	Ant.Pol. H/V	Emission Level(dBuV/m)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
--	--	--	--	--	--	--	--

Note: Data of measurement within this frequency range shown “ -- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission Above 1GHz(1GHz to 25GHz)

All antennas and modulation modes are tested, the data of the worst mode is described in the table.
Highest gain of each antenna and highest output power is ANT1 and MIMO as below:

ANT1:

Test mode: 802.11n(20) Frequency: Channel 1: 2412MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8175	V	56.90	74.00	17.10	peak
11523.7	V	63.64	74.00	10.36	peak
17686.8	V	67.67	74.00	6.33	peak
8175	V	39.56	54.00	14.44	AVG
11523.7	V	44.64	54.00	9.36	AVG
17686.8	V	46.00	54.00	8.00	AVG
8064.37	H	56.57	74.00	17.43	peak
11521.8	H	63.30	74.00	10.70	peak
17188.1	H	67.07	74.00	6.93	peak
8064.37	H	39.82	54.00	14.18	AVG
11521.8	H	44.59	54.00	9.41	AVG
17188.1	H	46.04	54.00	7.96	AVG

Test mode: 802.11n(20) Frequency: Channel 6: 2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8366.25	V	56.45	74.00	17.55	peak
11529.3	V	63.20	74.00	10.80	peak
17435.6	V	66.96	74.00	7.04	peak
8366.25	V	40.14	54.00	13.86	AVG
11529.3	V	44.51	54.00	9.49	AVG
17435.6	V	45.92	54.00	8.08	AVG
7603.12	H	55.71	74.00	18.29	peak
11491.8	H	64.86	74.00	9.14	peak
17300.6	H	66.22	74.00	7.78	peak
7603.12	H	39.58	54.00	14.42	AVG
11491.8	H	44.76	54.00	9.24	AVG
17300.6	H	46.08	54.00	7.92	AVG

Test mode: 802.11n(20) Frequency: Channel 11: 2472MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7308.75	V	54.93	74.00	19.07	peak
11595	V	63.30	74.00	10.70	peak
16483.1	V	66.37	74.00	7.63	peak
7308.75	V	38.28	54.00	15.72	AVG
11595	V	43.66	54.00	10.34	AVG
16483.1	V	45.95	54.00	8.05	AVG
7496.25	H	55.68	74.00	18.32	peak
11531.2	H	63.81	74.00	10.19	peak
17956.8	H	67.24	74.00	6.76	peak
7496.25	H	38.94	54.00	15.06	AVG
11531.2	H	44.92	54.00	9.08	AVG
17956.8	H	47.15	54.00	6.85	AVG

MIMO:

Test mode: 802.11n(20) Frequency: Channel 1: 2412MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8173.6100	V	56.77	74.00	17.23	Peak
11522.3100	V	63.48	74.00	10.52	Peak
17688.0800	V	67.64	74.00	6.36	Peak
8176.2800	V	39.54	54.00	14.46	Avg
11521.4500	V	44.38	54.00	9.62	Avg
17684.5500	V	45.81	54.00	8.19	Avg
8076.0600	H	56.49	74.00	17.51	Peak
11533.4900	H	63.09	74.00	10.91	Peak
17199.7900	H	66.91	74.00	7.09	Peak
8076.0600	H	39.68	54.00	14.32	Avg
11518.4900	H	44.41	54.00	9.59	Avg
17184.7900	H	45.91	54.00	8.09	Avg

Test mode: 802.11n(20) Frequency: Channel 6: 2437MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
8364.8600	V	56.32	74.00	17.68	Peak
11527.9100	V	63.04	74.00	10.96	Peak
17436.8800	V	66.93	74.00	7.07	Peak
8367.5300	V	40.12	54.00	13.88	Avg
11527.0500	V	44.25	54.00	9.75	Avg
17433.3500	V	45.73	54.00	8.27	Avg
7614.8100	H	55.63	74.00	18.37	Peak
11503.4900	H	64.65	74.00	9.35	Peak
17312.2900	H	66.06	74.00	7.94	Peak
7614.8100	H	39.44	54.00	14.56	Avg
11488.4900	H	44.58	54.00	9.42	Avg
17297.2900	H	45.95	54.00	8.05	Avg

Test mode: 802.11n(20) Frequency: Channel 11: 2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
7307.3600	V	54.80	74.00	19.20	Peak
11593.6100	V	63.14	74.00	10.86	Peak
16484.3800	V	66.34	74.00	7.66	Peak
7310.0300	V	38.26	54.00	15.74	Avg
11592.7500	V	43.40	54.00	10.60	Avg
16480.8500	V	45.76	54.00	8.24	Avg
7507.9400	H	55.60	74.00	18.40	Peak
11542.8900	H	63.60	74.00	10.40	Peak
17968.4900	H	67.08	74.00	6.92	Peak
7507.9400	H	38.80	54.00	15.20	Avg
11527.8900	H	44.74	54.00	9.26	Avg
17953.4900	H	47.02	54.00	6.98	Avg

- Note:** (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
 (2) Emission Level= Reading Level+Correct Factor.
 (3) Correct Factor= Ant_F + Cab_L - Preamp
 (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

■ Spurious Emission in Restricted Band 2310-2390MHz and 2483.5-2500MHz

Test mode: 802.11n(20) Frequency: Channel 1: 2412MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2389.89	V	62.33	74.00	11.67	peak
2389.89	V	43.91	54.00	10.09	AVG
2389.30	H	59.75	74.00	14.25	peak
2389.30	H	42.46	54.00	11.54	AVG

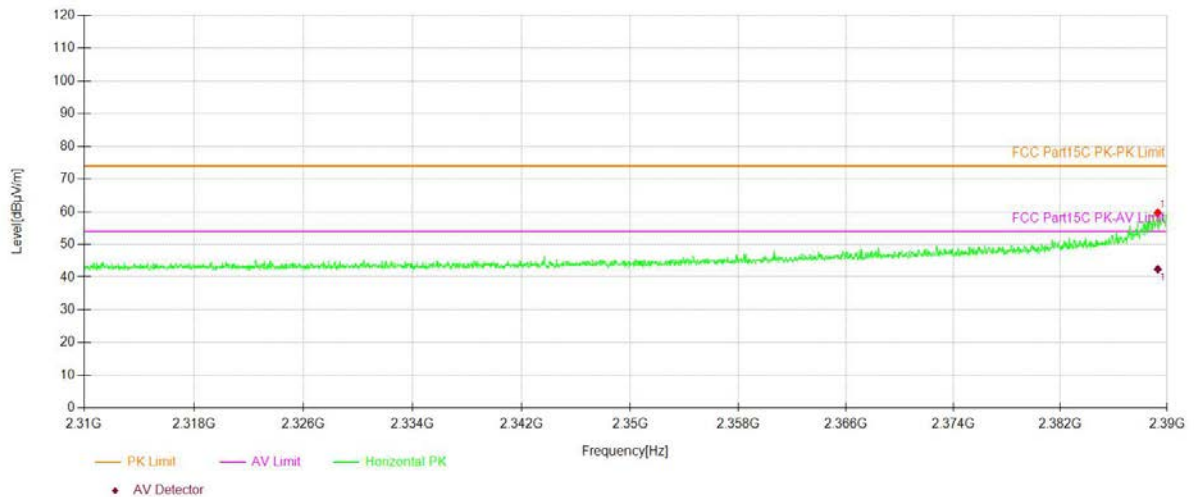
Test mode: 802.11n(20) Frequency: Channel 11: 2462MHz

Freq. (MHz)	Ant.Pol.	Emission Level(dBuV/m)	Limit 3m(dBuV/m)	Over(dB)	Detector
2483.57	V	56.40	74.00	17.60	peak
2483.57	V	37.89	54.00	16.11	AVG
2483.50	H	53.42	74.00	20.58	peak
2483.50	H	38.65	54.00	15.35	AVG

- Note:**
- (1) All Readings are Peak Value (VBW=3MHz) and Average Value (VBW=10Hz).
 - (2) Emission Level= Reading Level+Correct Factor.
 - (3) Correct Factor= Ant_F + Cab_L - Preamp
 - (4) The reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

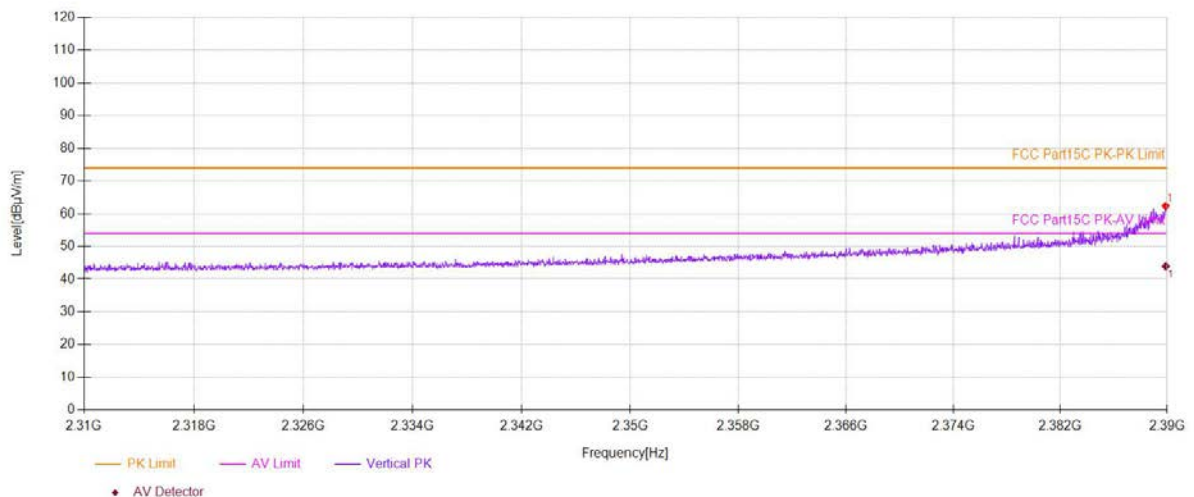
Spurious Emission in Restricted Band 2310-2390MHz

Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)
☒ Channel 1:2412MHz ☐ Channel 3: 2422MHz Polarity: H
 VBW=3MHz

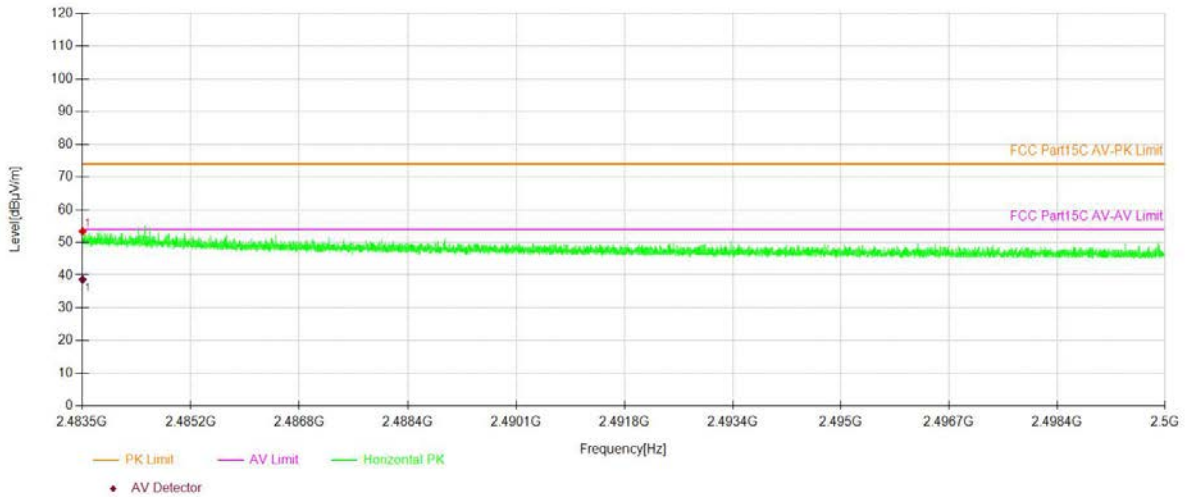


Spurious Emission in Restricted Band 2310-2390MHz

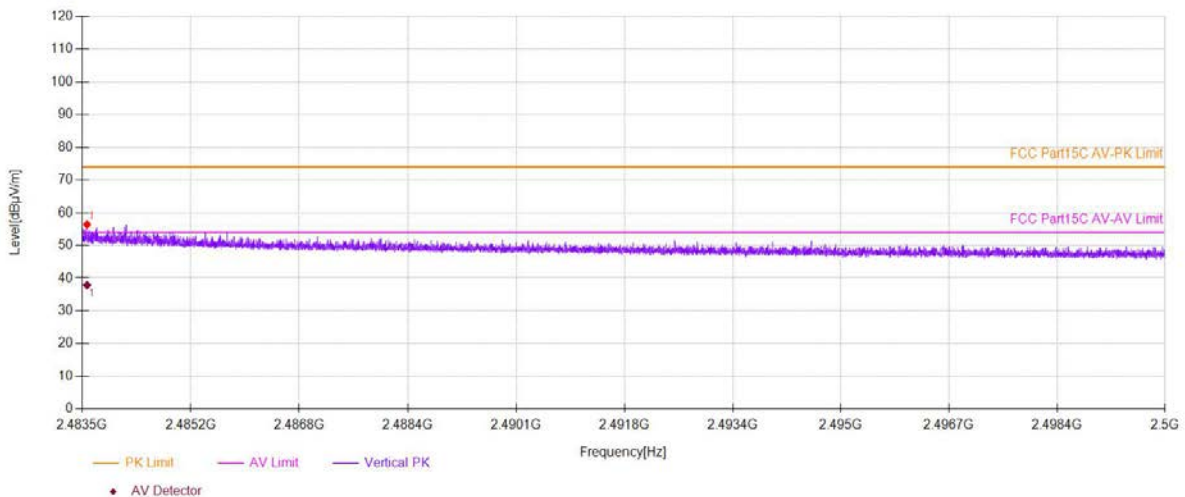
Test Model ☐ 802.11b ☐ 802.11g ☒ 802.11n(HT20) ☐ 802.11n(HT40)
☒ Channel 1:2412MHz ☐ Channel 3: 2422MHz Polarity: V
 VBW=3MHz



Test Model	Spurious Emission in Restricted Band 2483.5-2500MHz			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	☒ Channel 11: 2462MHz	☐ Channel 9: 2452MHz	Polarity: H	
	VBW=3MHz			

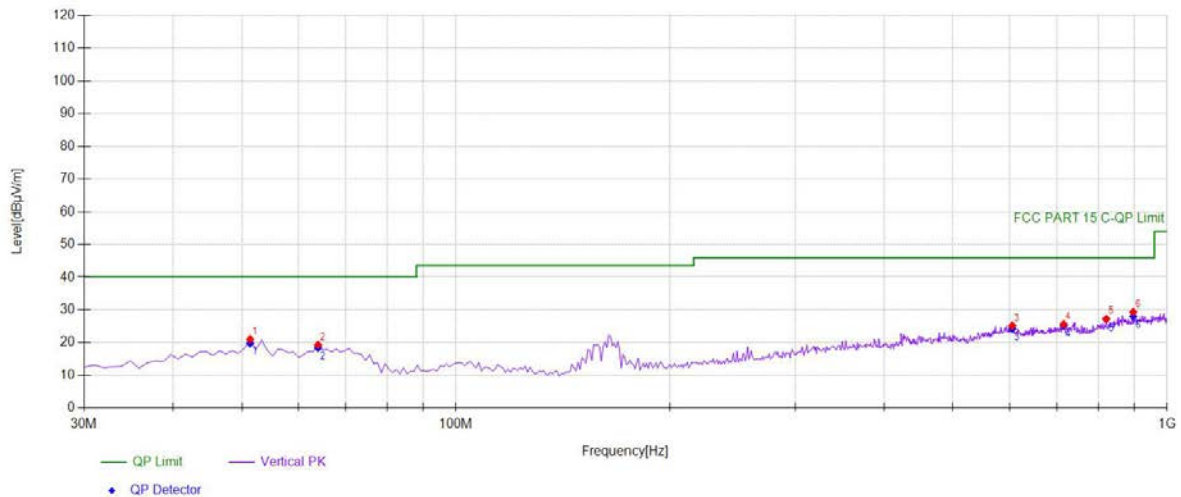


Test Model	Spurious Emission in Restricted Band2483.5-2500MHz			
	☐ 802.11b	☐ 802.11g	☒ 802.11n(HT20)	☐ 802.11n(HT40)
	☒ Channel 11: 2462MHz	☐ Channel 9: 2452MHz	Polarity: V	
	VBW=3MHz			



■ Spurious Emission below 1GHz (30MHz to 1GHz)

Test mode: 802.11b Frequency: Channel 1: 2412MHz

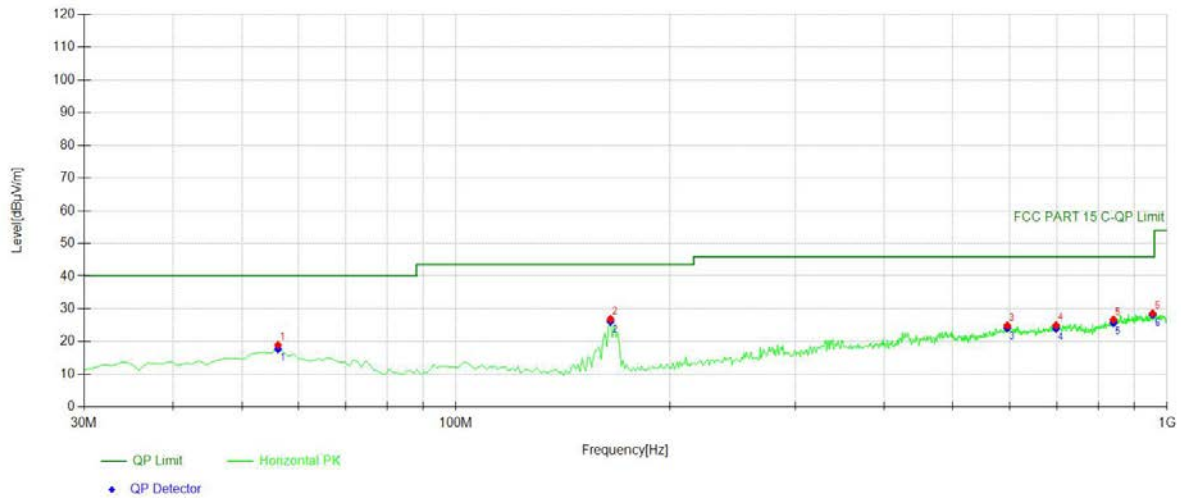


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	51.3614	37.23	-16.21	21.02	PK	40.00	18.98	Vertical
2	63.984	37.28	-17.94	19.34	PK	40.00	20.66	Vertical
3	605.785	31.60	-6.43	25.17	PK	46.00	20.83	Vertical
4	715.505	31.35	-5.76	25.59	PK	46.00	20.41	Vertical
5	821.341	31.91	-4.69	27.22	PK	46.00	18.78	Vertical
6	896.106	32.36	-3.02	29.34	PK	46.00	16.66	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	51.3614	-16.21	19.80	40.00	20.20
2	63.984	-17.94	18.42	40.00	21.58
3	605.7858	-6.43	24.25	46.00	21.75
4	715.5055	-5.76	25.21	46.00	20.79
5	821.3413	-4.69	27.13	46.00	18.87
6	896.1061	-3.02	28.04	46.00	17.96



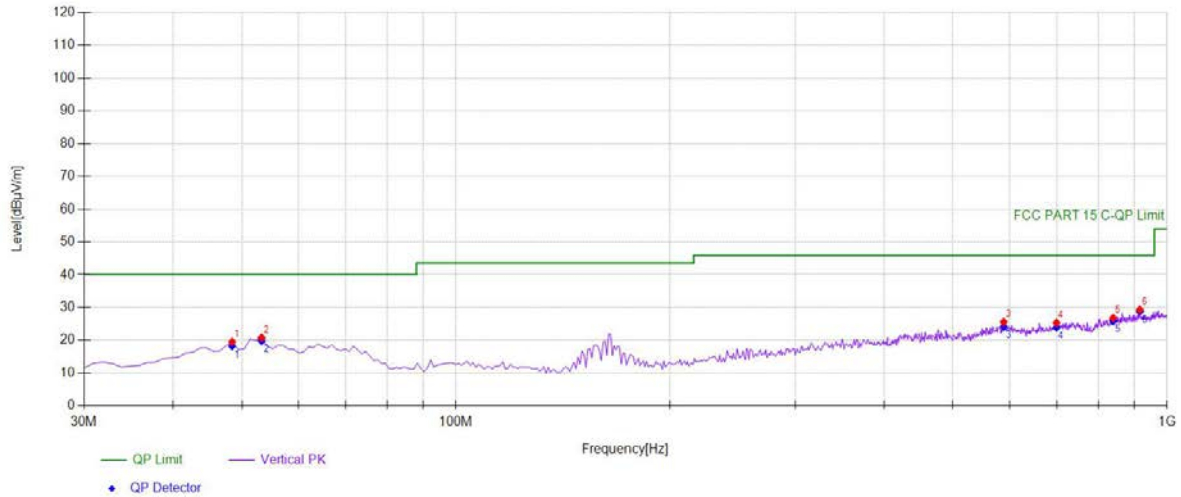
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	56.2162	35.81	-16.87	18.94	PK	40.00	21.06	Horizontal
2	164.965	46.09	-19.24	26.85	PK	43.50	16.65	Horizontal
3	596.076	31.23	-6.34	24.89	PK	46.00	21.11	Horizontal
4	698.028	30.92	-5.96	24.96	PK	46.00	21.04	Horizontal
5	840.760	30.99	-4.33	26.66	PK	46.00	19.34	Horizontal
6	954.364	30.90	-2.31	28.59	PK	46.00	17.41	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	56.2162	-16.87	17.68	40.00	22.32
2	164.965	-19.24	26.13	43.50	17.37
3	596.0761	-6.34	24.17	46.00	21.83
4	698.028	-5.96	23.99	46.00	22.01
5	840.7608	-4.33	25.69	46.00	20.31
6	954.3644	-2.31	28.16	46.00	17.84

Test mode: 802.11b Frequency: Channel 6: 2437MHz

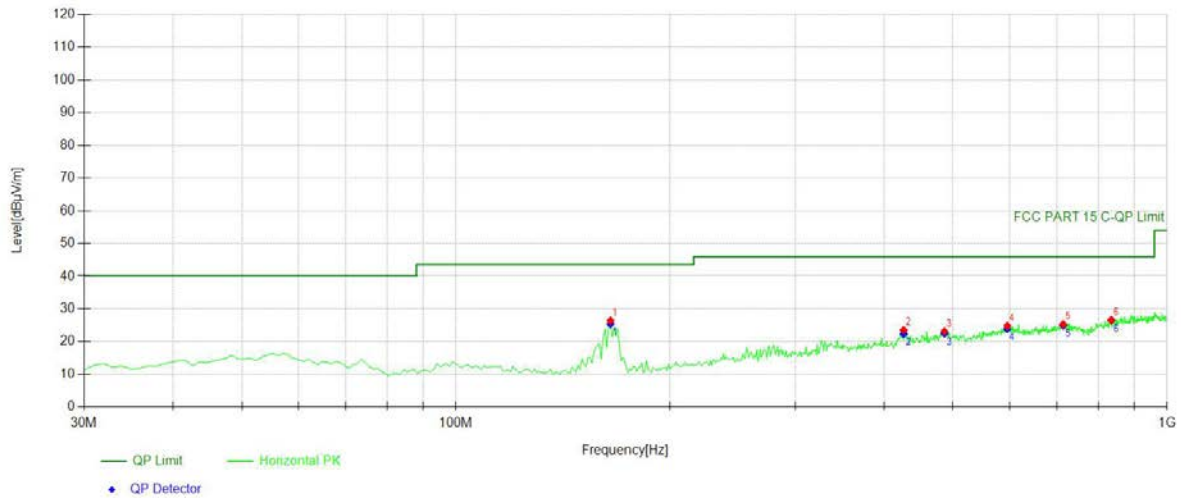


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	48.4484	35.78	-16.24	19.54	PK	40.00	20.46	Vertical
2	53.3033	37.28	-16.47	20.81	PK	40.00	19.19	Vertical
3	589.279	32.29	-6.73	25.56	PK	46.00	20.44	Vertical
4	698.999	31.26	-5.92	25.34	PK	46.00	20.66	Vertical
5	839.789	31.16	-4.37	26.79	PK	46.00	19.21	Vertical
6	915.525	31.96	-2.64	29.32	PK	46.00	16.68	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	48.4484	-16.24	18.24	40.00	21.76
2	53.3033	-16.47	19.81	40.00	20.19
3	589.2793	-6.73	24.13	46.00	21.87
4	698.999	-5.92	23.96	46.00	22.04
5	839.7898	-4.37	25.95	46.00	20.05
6	915.5255	-2.64	28.77	46.00	17.23



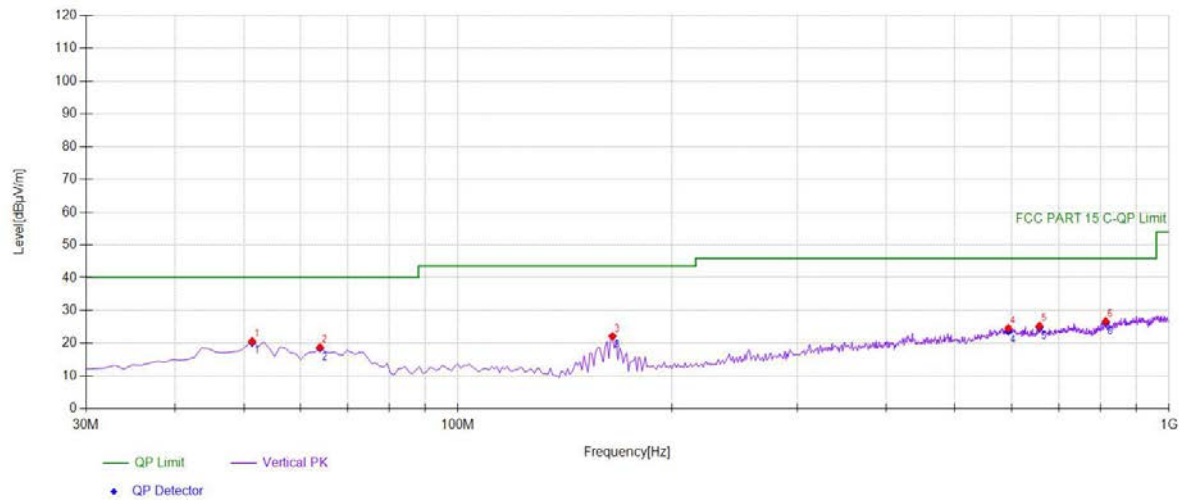
Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	164.965	45.59	-19.24	26.35	PK	43.50	17.15	Horizontal
2	426.156	35.04	-11.50	23.54	PK	46.00	22.46	Horizontal
3	486.356	33.04	-9.90	23.14	PK	46.00	22.86	Horizontal
4	596.076	31.12	-6.34	24.78	PK	46.00	21.22	Horizontal
5	714.534	31.04	-5.76	25.28	PK	46.00	20.72	Horizontal
6	834.934	31.01	-4.48	26.53	PK	46.00	19.47	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	164.965	-19.24	25.42	43.50	18.08
2	426.1562	-11.50	22.36	46.00	23.64
3	486.3564	-9.90	22.50	46.00	23.50
4	596.0761	-6.34	23.90	46.00	22.10
5	714.5345	-5.76	24.93	46.00	21.07
6	834.9349	-4.48	26.48	46.00	19.52

Test mode: 802.11b Frequency: Channel 11: 2462MHz

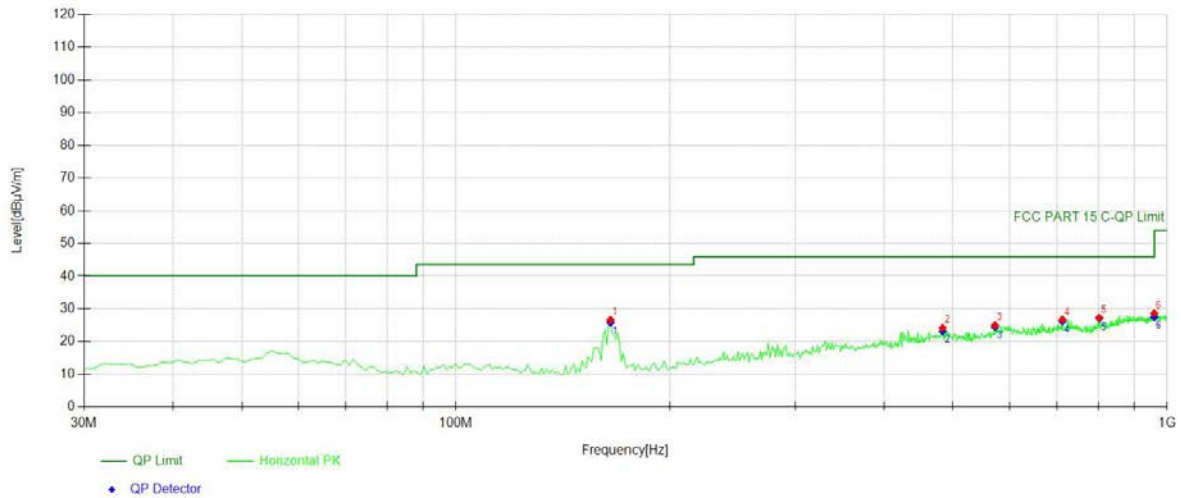


Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	51.3614	36.81	-16.21	20.60	PK	40.00	19.40	Vertical
2	63.984	36.74	-17.94	18.80	PK	40.00	21.20	Vertical
3	164.965	41.37	-19.24	22.13	PK	43.50	21.37	Vertical
4	594.134	31.06	-6.44	24.62	PK	46.00	21.38	Vertical
5	657.247	32.03	-6.76	25.27	PK	46.00	20.73	Vertical
6	814.544	31.45	-4.79	26.66	PK	46.00	19.34	Vertical

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	51.3614	-16.21	20.30	40.00	19.70
2	63.984	-17.94	18.50	40.00	21.50
3	164.965	-19.24	22.12	43.50	21.38
4	594.1341	-6.44	23.65	46.00	22.35
5	657.2472	-6.76	24.83	46.00	21.17
6	814.5445	-4.79	26.22	46.00	19.78



Suspected Data List

NO.	Freq. [MHz]	Reading [dBμV]	Factor [dB/m]	Level [dBμV/m]	Detector	Limit [dBμV/m]	Margin [dB]	Polarity
1	164.965	45.83	-19.24	26.59	PK	43.50	16.91	Horizontal
2	483.443	34.08	-9.91	24.17	PK	46.00	21.83	Horizontal
3	572.772	32.56	-7.57	24.99	PK	46.00	21.01	Horizontal
4	712.592	32.46	-5.77	26.69	PK	46.00	19.31	Horizontal
5	802.892	32.31	-5.04	27.27	PK	46.00	18.73	Horizontal
6	959.219	30.65	-2.01	28.64	PK	46.00	17.36	Horizontal

Final Data List

NO.	Freq. [MHz]	Factor [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]
1	164.965	-19.24	25.82	43.50	17.68
2	483.4434	-9.91	23.15	46.00	22.85
3	572.7728	-7.57	24.51	46.00	21.49
4	712.5926	-5.77	26.21	46.00	19.79
5	802.8929	-5.04	27.08	46.00	18.92
6	959.2192	-2.01	27.49	46.00	18.51

7.6 CONDUCTED EMISSION TEST

7.6.1 Applicable Standard

According to IC RSS-Gen 8.8

7.6.2 Conformance Limit

FCC Part 15, Subpart B, Class B

Conducted Emission Limit		
Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:
 1. The lower limit shall apply at the transition frequencies
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

7.6.3 Test Configuration

Test according to clause 6.3 conducted emission test setup 3.

7.6.4 Test Procedure

The EUT was placed on a table which is 0.8m above ground plane.
 Maximum procedure was performed on the highest emissions to ensure EUT compliance.
 Repeat above procedures until all frequency measured were complete.

7.6.5 Test Results

N/A

Not applicable, since EUT is DC power.

7.7 ANTENNA APPLICATION

7.7.1 Antenna Requirement

Standard	Requirement
FCC CRF Part15.203	An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi..

7.7.2 Result

PASS

Temperature : 24.9°C ATM Pressure: 1011 mbar
Humidity : 49 % Test Engineer: GJ

The EUT is Ant1: External Antenna, Ant2: Integrated Antenna, Ant1: 3.93dBi, Ant2: 3.47dBi, Beamforming: 4.43dBi.

- ☐ Antenna uses a permanently attached antenna which is not replaceable.
- ☒ Not using a standard antenna jack or electrical connector for antenna replacement.
- ☐ The antenna has to be professionally installed (please provide method of installation).

Which in accordance to section 15.203, please refer to the internal photos.

Detail of factor for radiated emission:

Frequency(MHz)	Ant_F(dB)	Cab_L(dB)	Preamp(dB)	Correct Factor(dB)
0.009	20.6	0.03	\	20.63
0.15	20.7	0.1	\	20.8
1	20.9	0.15	\	21.05
10	20.1	0.28	\	20.38
30	18.8	0.45	\	19.25
30	11.7	0.62	27.9	-15.58
100	12.5	1.02	27.8	-14.28
300	12.9	1.91	27.5	-12.69
600	19.2	2.92	27	-4.88
800	21.1	3.54	26.6	-1.96
1000	22.3	4.17	26.2	0.27
1000	25.6	1.76	41.4	-14.04
3000	28.9	3.27	43.2	-11.03
5000	31.1	4.2	44.6	-9.3
8000	36.2	5.95	44.7	-2.55
10000	38.4	6.3	43.9	0.8
12000	38.5	7.14	42.3	3.34
15000	40.2	8.15	41.4	6.95
18000	45.4	9.02	41.3	13.12
18000	37.9	1.81	47.9	-8.19
21000	37.9	1.95	48.7	-8.85
25000	39.3	2.01	42.8	-1.49
28000	39.6	2.16	46.0	-4.24
31000	41.2	2.24	44.5	-1.06
34000	41.5	2.29	46.6	-2.81
37000	43.8	2.30	46.4	-0.3
40000	43.2	2.50	42.2	3.5

--- End of Report ---

声 明 Statement

1. 本报告无授权批准人签字及“检验检测专用章”无效。
1. This report is invalid without the signature of the authorized approver and "special seal for testing".
2. 未经许可本报告不得部分复制。
2. This report shall not be copied partly without authorization.
3. 本报告的检测结果仅对送测样品有效，委托方对样品的代表性和资料的真实性负责。
3. The test results or observations are applicable only to tested sample. Client shall be responsible for representativeness of the sample and authenticity of the material.
4. 本检测报告中检测项目标注有特殊符号则该项目不在资质认定范围内，仅作为客户委托、科研、教学或内部质量控制等目的使用。
4. The observations or tests with special mark fall outside the scope of accreditation, and are only used for purpose of commission, research, training, internal quality control etc.
5. 本检测报告以实测值进行符合性判定，未考虑不确定度所带来的风险，本实验室不承担相关责任，特别约定、标准或规范中有明确规定的除外。
5. The test results or observations are provided in accordance with measured value, without taking risks caused by uncertainty into account. Without explicit stipulation in special agreements, standards or regulations, EMTEK shall not assume any responsibility.
6. 对本检验报告若有异议，请于收到报告之日起 20 日内提出。
6. Objections shall be raised within 20 days from the date receiving the report.