

11ax_HE20_26T (UNII-3)

A. Low Channel (5 745 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5 633.47	12.01	Peak	V	34.10	12.52	58.63	68.23	9.60
5 658.63	11.77	Peak	V	34.12	12.92	58.81	74.61	15.80
5 710.29	11.40	Peak	V	34.20	13.25	58.85	108.11	49.26
5 725.00	11.45	Peak	V	34.20	13.42	59.07	122.23	63.16

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 785 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 805 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5 851.15	10.60	Peak	V	34.30	13.50	58.40	119.61	61.21
5 860.98	11.92	Peak	V	34.34	13.33	59.59	109.15	49.56
5 905.13	11.47	Peak	V	34.51	12.98	58.96	82.93	23.97
5 938.87	12.19	Peak	V	34.58	12.63	59.40	68.23	8.83

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

11ax_HE20_SU (UNII-1)

A. Low Channel (5 180 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	14.17	Peak	V	32.10	10.90	-	57.17	74.00	16.83
*4 500.00	0.78	Average	V	32.10	10.90	2.32	43.78	54.00	10.22
*4 593.20	15.85	Peak	V	32.09	10.44	-	58.38	74.00	15.62
*5 120.40	0.51	Average	V	33.50	12.19	2.32	46.20	54.00	7.80
*5 150.00	14.08	Peak	V	33.50	12.65	-	60.23	74.00	13.77
*5 150.00	0.53	Average	V	33.50	12.65	2.32	46.68	54.00	7.32

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

B. Middle Channel (5 220 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

C. High Channel (5 240 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

11ax_HE20_SU (UNII-3)

A. Low Channel (5 745 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 650.00	15.83	Peak	V	34.10	12.74	62.67	68.23	5.56
5 659.02	16.47	Peak	V	34.12	12.92	63.51	74.90	11.39
5 713.87	14.71	Peak	V	34.20	13.29	62.20	109.11	46.91
5 725.00	13.64	Peak	V	34.20	13.42	61.26	122.23	60.97

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

B. Middle Channel (5 785 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

C. High Channel (5 805 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 850.00	13.46	Peak	V	34.40	13.52	61.38	122.23	60.85
5 866.67	14.70	Peak	V	34.37	13.23	62.30	107.56	45.26
5 890.36	15.52	Peak	V	34.46	13.03	63.01	93.87	30.86
5 933.83	16.19	Peak	V	34.57	12.72	63.48	68.23	4.75

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

11ax_HE40_26T (UNII-1)

A. Low Channel (5 190 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
*4 500.00	9.10	Peak	V	32.10	10.90	-	52.10	74.00	21.90
*4 500.00	1.09	Average	V	32.10	10.90	0.50	44.59	54.00	9.41
*4 577.20	12.42	Peak	V	32.05	10.41	-	54.88	74.00	19.12
*4 618.00	0.80	Average	V	32.14	10.37	0.50	43.81	54.00	10.19
*5 150.00	10.47	Peak	V	33.50	12.65	-	56.62	74.00	17.38
*5 150.00	0.84	Average	V	33.50	12.65	0.50	47.49	54.00	6.51

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

B. High Channel (5 230 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

11ax_HE40_26T (UNII-3)

A. Low Channel (5 755 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5 634.50	12.08	Peak	V	34.10	12.53	58.71	68.23	9.52
5 660.48	12.13	Peak	V	34.12	12.95	59.20	75.98	16.78
5 706.40	11.82	Peak	V	34.20	13.21	59.23	107.02	47.79
5 722.39	11.15	Peak	V	34.20	13.39	58.74	116.28	57.54

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

B. High Channel (5 795 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5 851.61	10.51	Peak	V	34.31	13.49	58.31	118.56	60.25
5 863.74	11.03	Peak	V	34.35	13.28	58.66	108.38	49.72
5 915.25	11.54	Peak	V	34.53	12.94	59.01	75.44	16.43
5 953.13	12.48	Peak	V	34.60	12.37	59.45	68.26	8.81

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

11ax_HE40_SU (UNII-1)

A. Low Channel (5 190 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
*4 500.00	14.33	Peak	V	32.10	10.90	-	57.33	74.00	16.67
*4 500.00	0.93	Average	V	32.10	10.90	3.17	47.10	54.00	6.90
*4 675.60	16.43	Peak	V	32.25	10.63	-	59.31	74.00	14.69
*4 611.60	1.01	Average	V	32.12	10.40	3.17	46.70	54.00	7.30
*5 150.00	14.40	Peak	V	33.50	12.65	-	60.55	74.00	13.45
*5 150.00	1.56	Average	V	33.50	12.65	3.17	50.88	54.00	3.12

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

B. High Channel (5 230 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

11ax_HE40_SU (UNII-3)

A. Low Channel (5 755 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 610.56	15.27	Peak	V	34.10	12.58	61.95	68.23	6.28
5 676.86	16.11	Peak	V	34.15	13.24	63.50	88.10	24.60
5 712.92	15.45	Peak	V	34.20	13.28	62.93	108.85	45.92
5 725.00	14.81	Peak	V	34.20	13.42	62.43	122.23	59.80

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

B. High Channel (5 795 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 851.09	15.00	Peak	V	34.30	13.50	62.80	119.74	56.94
5 869.89	14.44	Peak	V	34.38	13.17	61.99	106.66	44.67
5 916.58	16.52	Peak	V	34.53	12.93	63.98	74.46	10.48
5 946.94	16.05	Peak	V	34.59	12.47	63.11	68.23	5.12

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

11ax_HE80_26T (UNII-1)

A. Middle Channel (5 210 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
*4 500.00	12.80	Peak	V	32.00	10.90	-	55.70	74.00	18.30
*4 500.00	0.86	Average	V	32.00	10.90	1.29	45.05	54.00	8.95
*4 777.35	14.10	Peak	V	32.61	10.84	-	57.55	74.00	16.45
*4 610.00	0.85	Average	V	31.94	10.41	1.29	44.49	54.00	9.51
*5 150.00	11.58	Peak	V	33.60	12.65	-	57.83	74.00	16.17
*5 150.00	0.80	Average	V	33.60	12.65	1.29	48.34	54.00	5.66

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

11ax_HE80_26T (UNII-3)

A. Middle Channel (5 775 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
5 644.49	13.12	Peak	V	34.10	12.67	59.89	68.23	8.34
5 672.96	14.02	Peak	V	34.15	13.21	61.38	85.22	23.84
5 705.17	13.11	Peak	V	34.20	13.19	60.50	106.68	46.18
5 721.57	12.23	Peak	V	34.20	13.38	59.81	114.41	54.60
5 851.15	10.58	Peak	V	34.30	13.50	58.38	119.61	61.23
5 870.87	10.59	Peak	V	34.38	13.15	58.12	106.38	48.26
5 917.32	12.42	Peak	V	34.53	12.93	59.88	73.91	14.03
5 962.10	12.71	Peak	V	34.60	12.26	59.57	68.37	8.80

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dB μ V)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

11ax_HE80_SU (UNII-1)

A. Middle Channel (5 210 MHz)

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
*4 500.00	14.08	Peak	V	32.10	10.90	-	57.08	74.00	16.92
*4 500.00	0.57	Average	V	32.10	10.90	2.74	46.31	54.00	7.69
*4 642.30	16.05	Peak	V	32.18	10.48	-	58.71	74.00	15.29
*4 611.60	1.09	Average	V	32.12	10.40	2.74	46.35	54.00	7.65
*5 150.00	13.78	Peak	V	33.50	12.65	-	59.93	74.00	14.07
*5 150.00	1.46	Average	V	33.50	12.65	2.74	50.35	54.00	3.65

Radiated Emissions			Ant.	Correction Factors			Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	DF (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-	-

11ax_HE80_SU (UNII-3)

A. Middle Channel (5 775 MHz)

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
5 613.02	15.11	Peak	V	34.10	12.55	61.76	68.23	6.47
5 650.00	14.82	Peak	V	34.10	12.74	61.66	68.23	6.57
5 712.85	14.44	Peak	V	34.20	13.28	61.92	108.83	46.91
5 720.00	13.63	Peak	V	34.20	13.36	61.19	110.83	49.64
5 850.00	13.24	Peak	V	34.40	13.52	61.16	122.23	61.07
5 862.53	15.01	Peak	V	34.35	13.30	62.66	108.72	46.06
5 919.11	15.38	Peak	V	34.54	12.92	62.84	72.59	9.75
5 971.32	16.96	Peak	V	34.60	12.15	63.71	68.47	4.76

Radiated Emissions			Ant.	Correction Factors		Total	Limit	
Frequency (MHz)	Reading (dBμV)	Detect Mode	Pol.	AF (dB/m)	AMP+CL (dB)	Actual (dBμV/m)	Limit (dBμV/m)	Margin (dB)
Above 1 000.00	Not detected	-	-	-	-	-	-	-

Remark;

1. “*” means the restricted band.
2. Radiated emissions measured in frequency above 1 000 MHz were made with an instrument using Peak / average detector mode if frequency was in restricted band. Otherwise the frequency was out of restricted band, only peak detector should be used.
3. Actual = Reading + AF + CL + (DF) or Reading + AF + AMP + CL + (DF).
4. If frequency was out of restricted band, the calculation method for peak limit is same as below.
 $68.23 \text{ dB}\mu\text{V/m} = \text{EIRP} - 20 \log(d) + 104.77 = -27 - 20 \log(3) + 104.77$
5. In case of the emissions within $\pm 75 \text{ MHz}$ from band edge of UNII-3, limit should be adjusted to emission mask of 15.407(4)(i).
6. According to § 15.31(o), emission levels are not reported much lower than the limits by over 20 dB.
7. The maximized peak measured value complies with the average limit, to perform an average measurement is unnecessary.

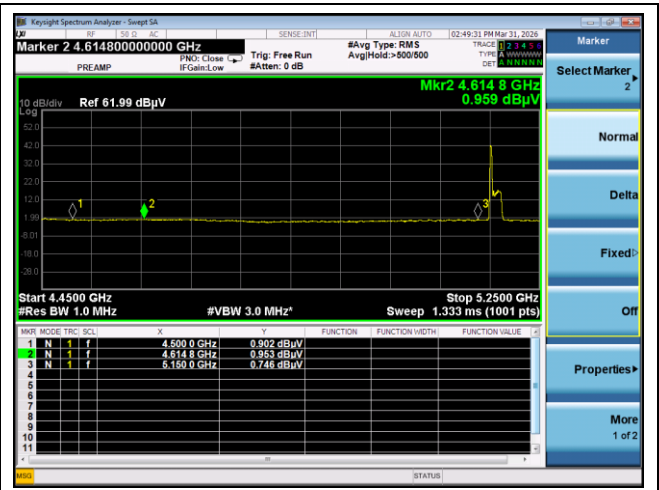
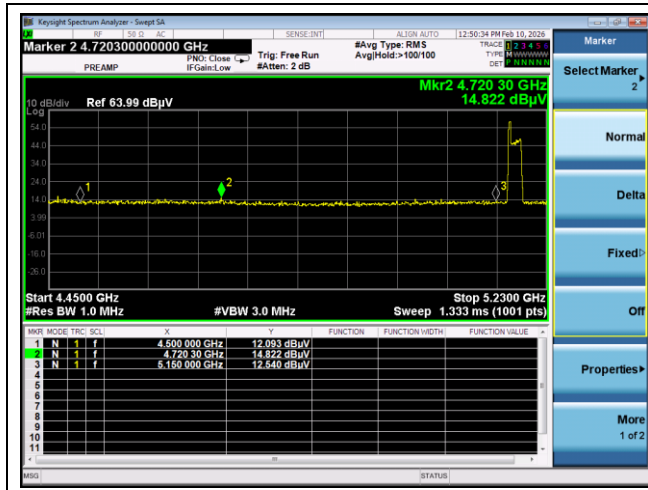
Test plots

SISO (Ant.3)

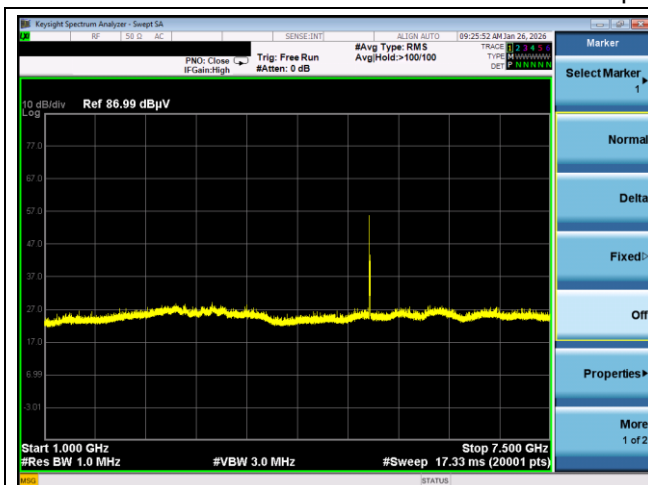
11ax_HE20_26T

Low channel Band edge (Peak) - UNII-1

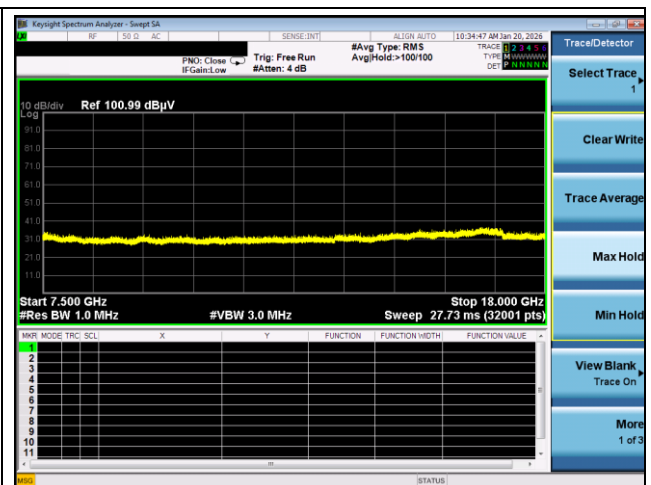
Low channel Band edge (Average) - UNII-1



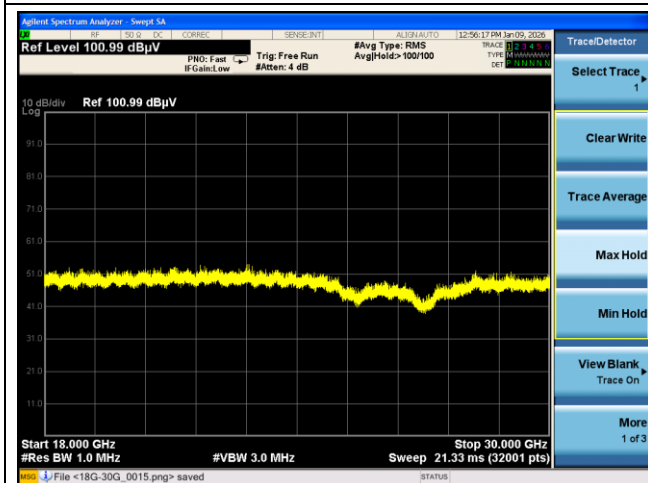
Radiated Spurious Emissions



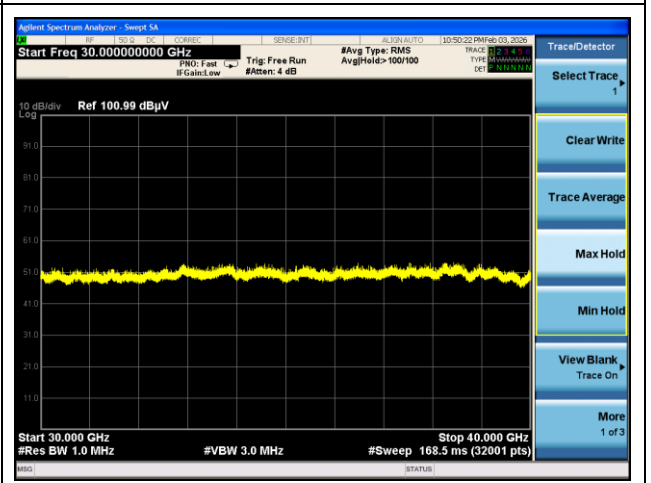
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz



30 GHz ~ 40 GHz

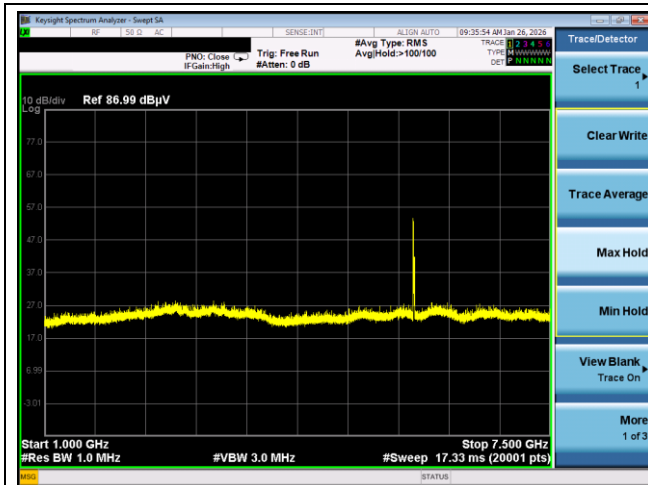
Low channel Band edge (Peak) - UNII-3



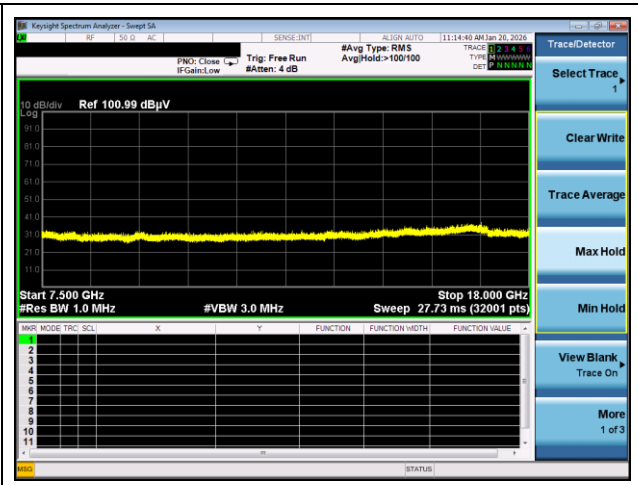
High channel Band edge (Peak) - UNII-3



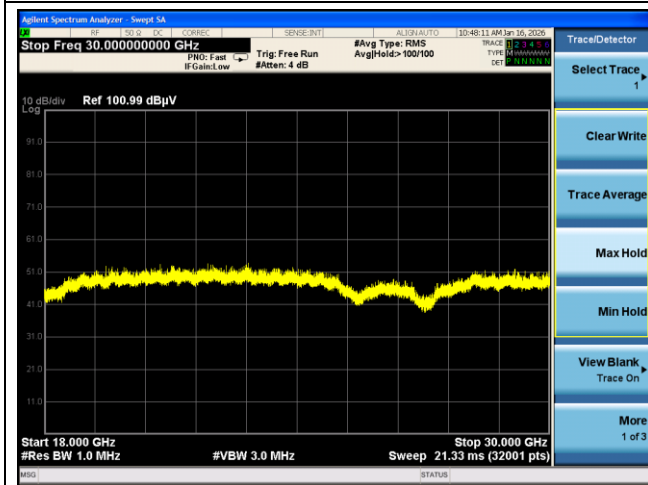
Radiated Spurious Emissions



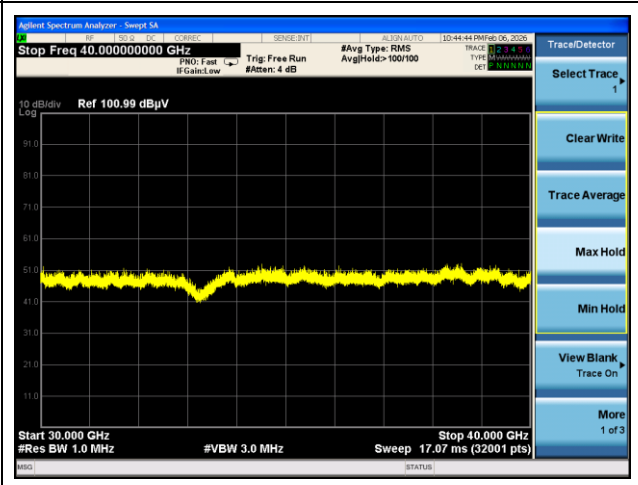
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz

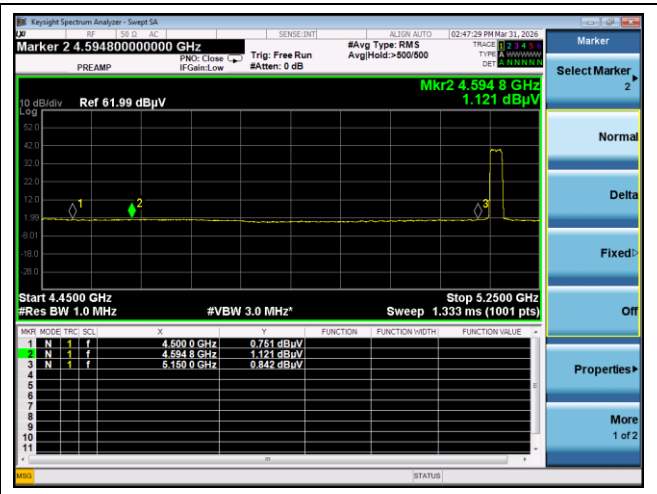
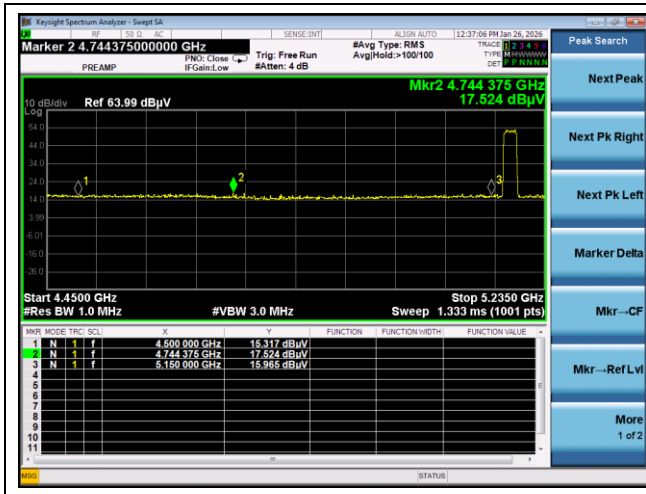


30 GHz ~ 40 GHz

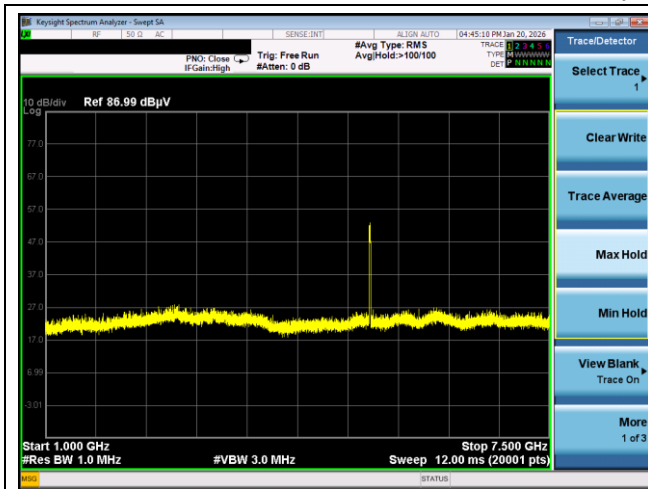
11ax_HE20_SU

Low channel Band edge (Peak) - UNII-1

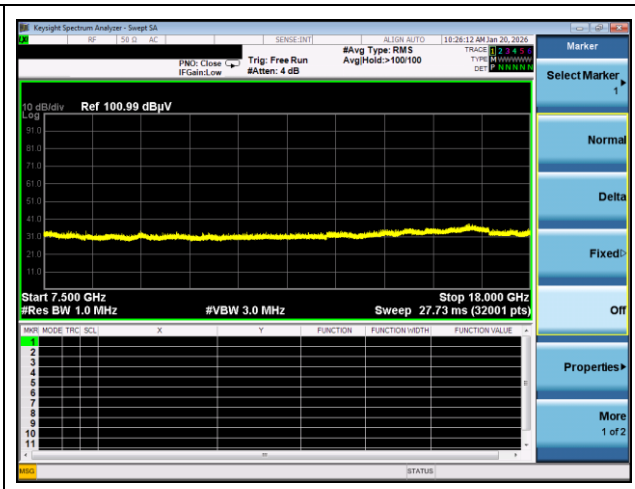
Low channel Band edge (Average) - UNII-1



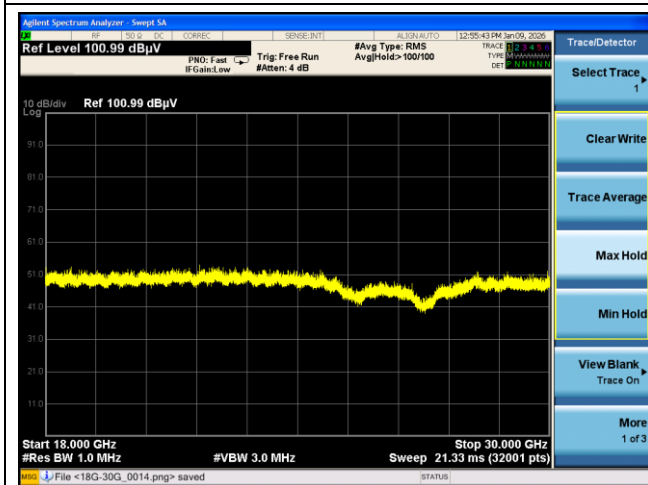
Radiated Spurious Emissions



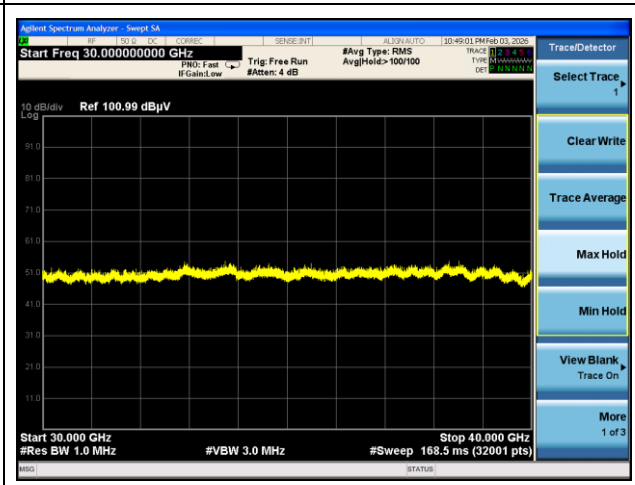
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz

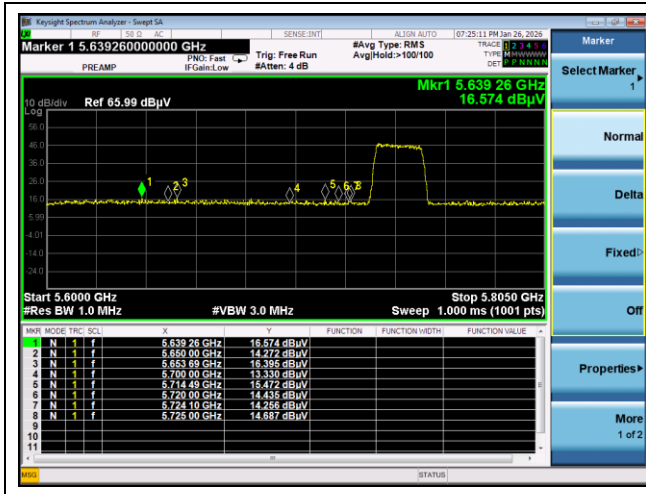


18 GHz ~ 30 GHz

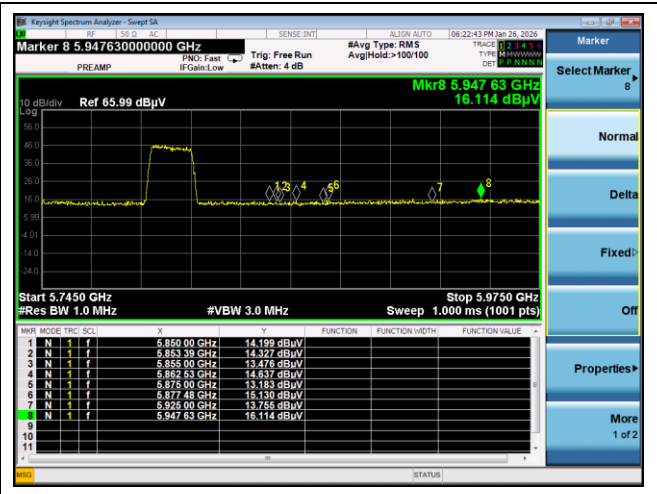


30 GHz ~ 40 GHz

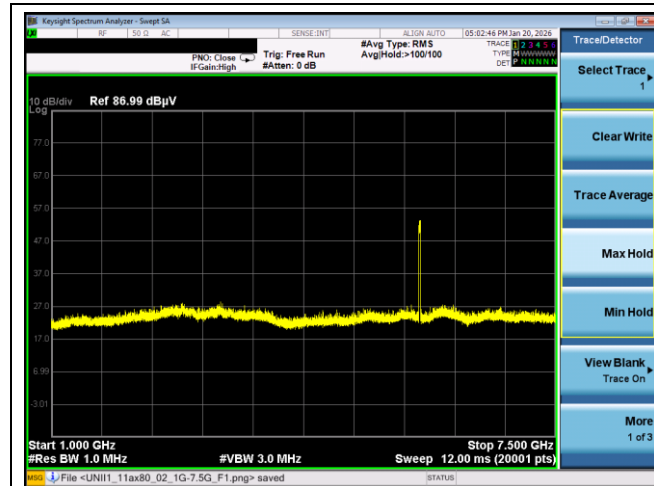
Low channel Band edge (Peak) - UNII-3



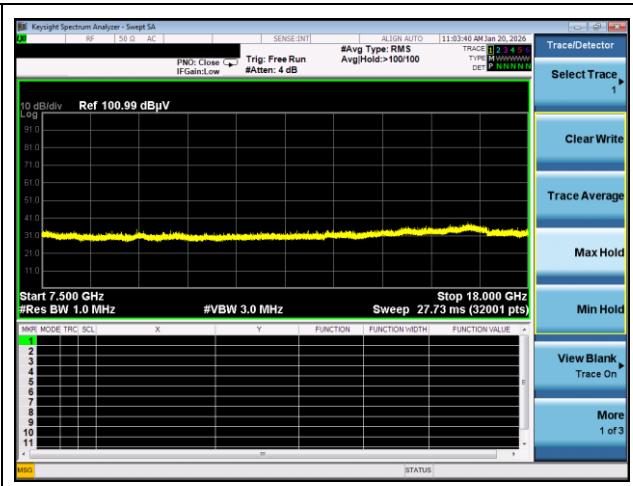
High channel Band edge (Peak) - UNII-3



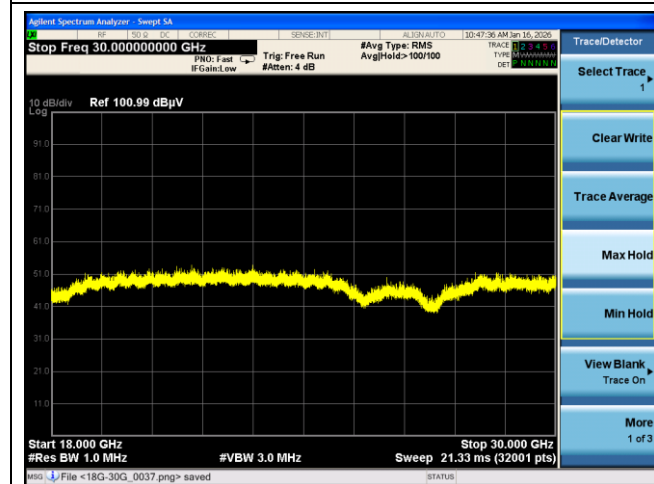
Radiated Spurious Emissions



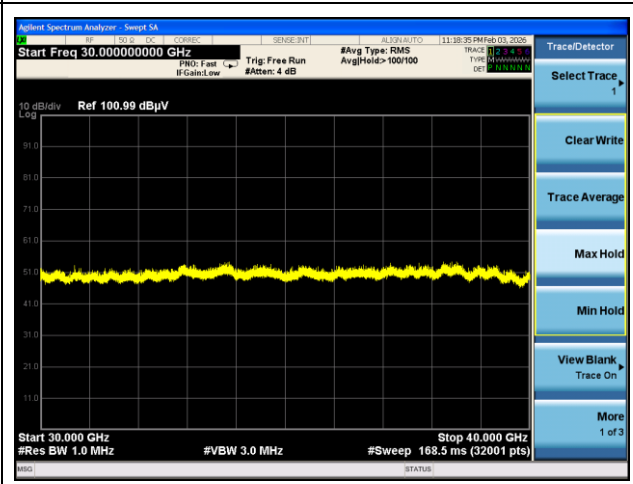
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz

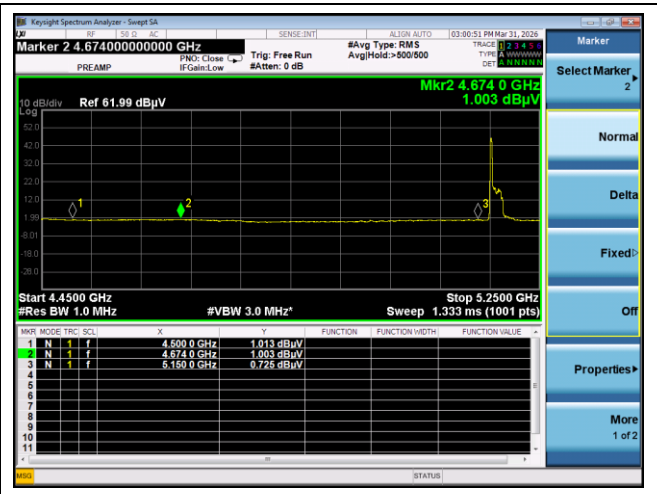
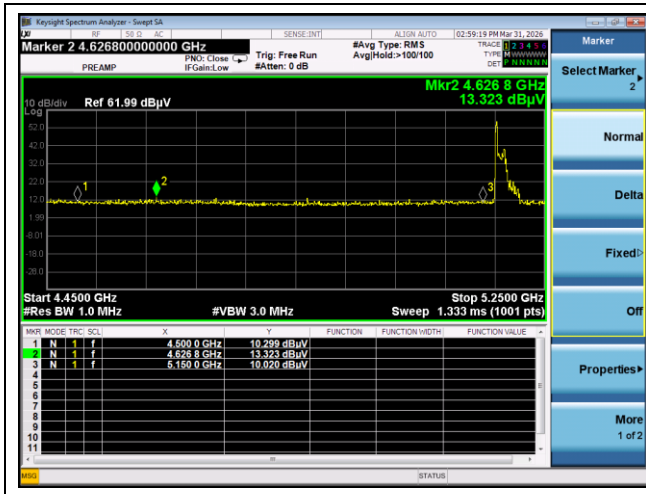


30 GHz ~ 40 GHz

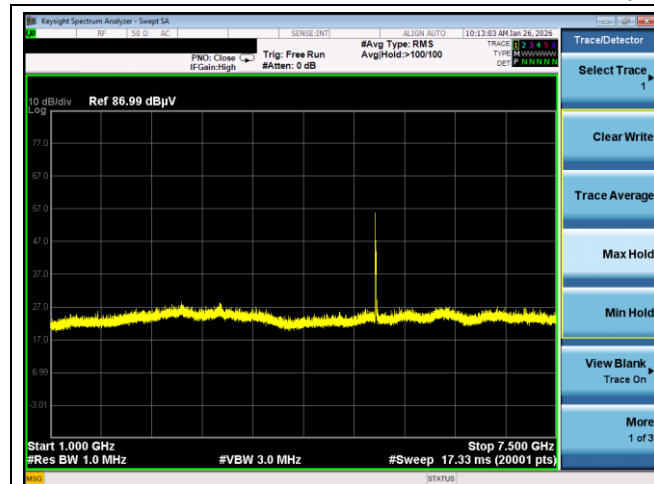
11ax_HE40_26T

Low channel Band edge (Peak) - UNII-1

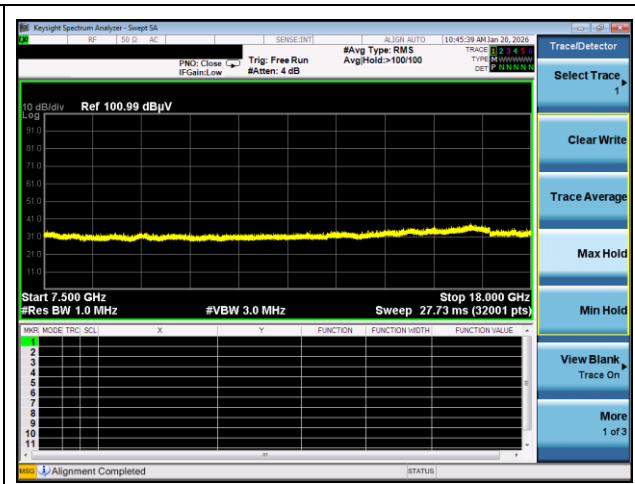
Low channel Band edge (Average) - UNII-1



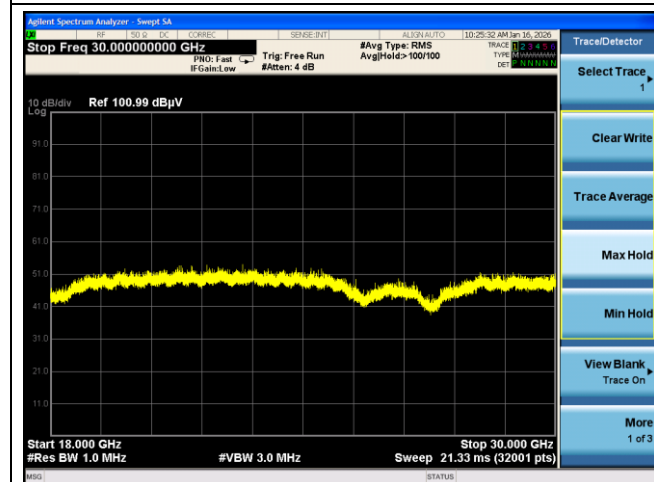
Radiated Spurious Emissions



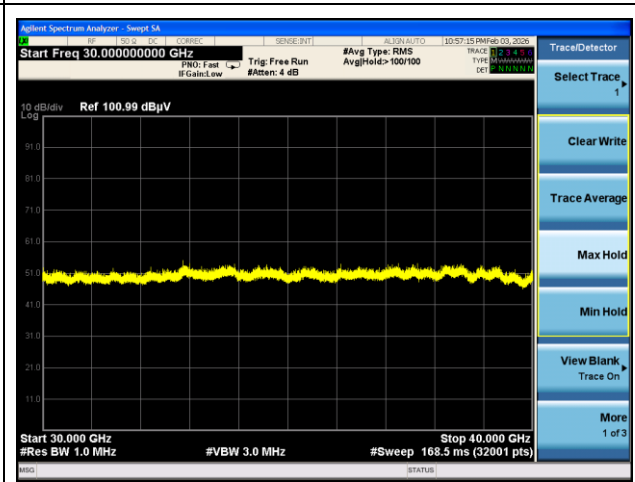
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz



30 GHz ~ 40 GHz

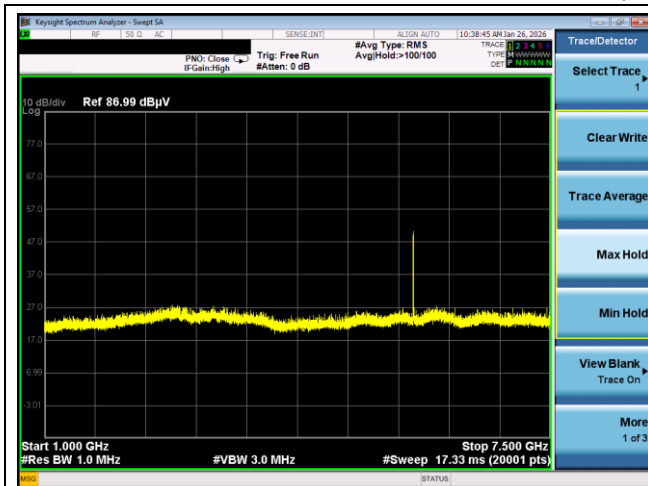
Low channel Band edge (Peak) - UNII-3



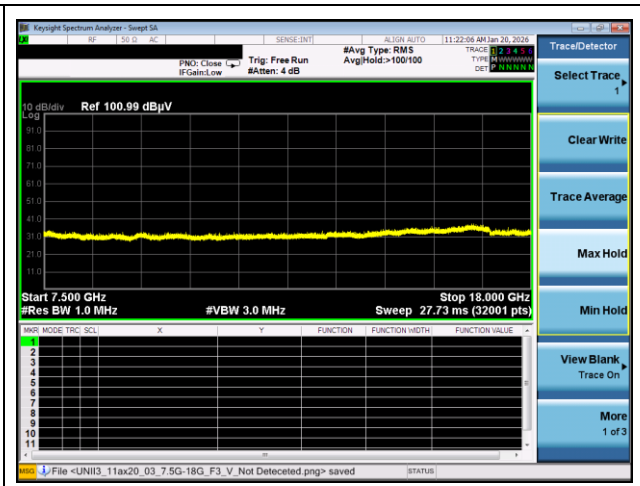
High channel Band edge (Peak) - UNII-3



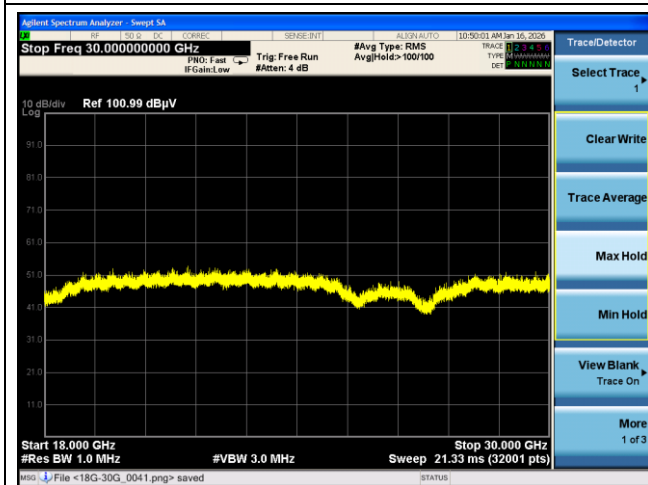
Radiated Spurious Emissions



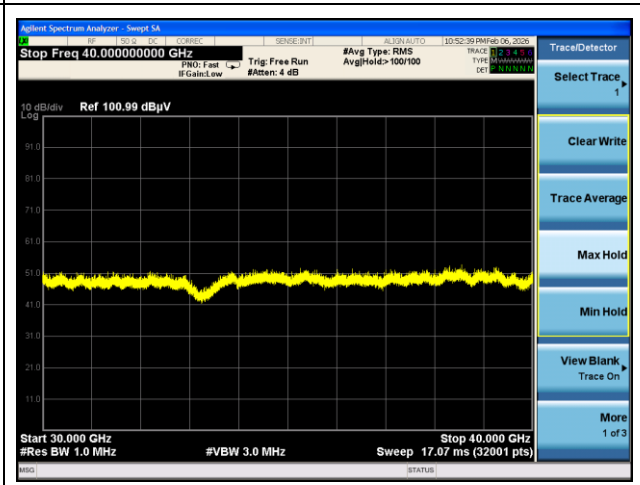
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz

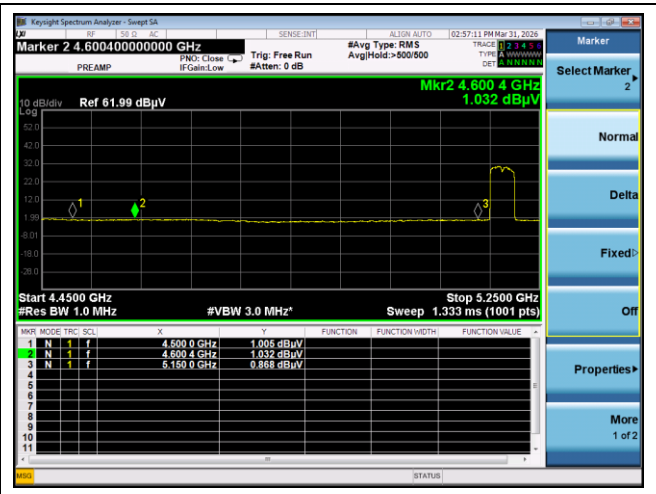
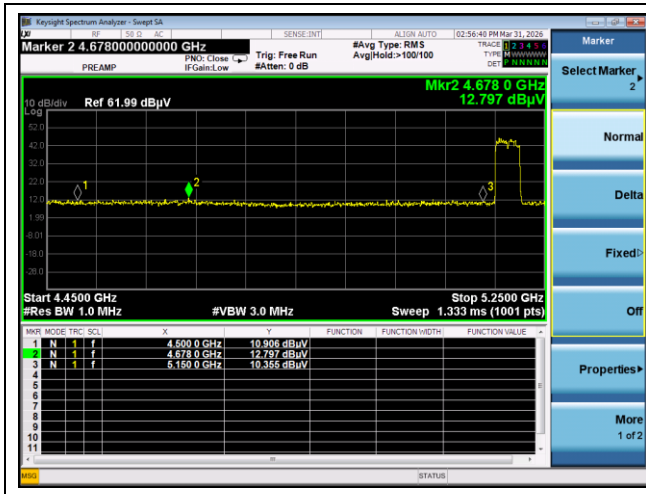


30 GHz ~ 40 GHz

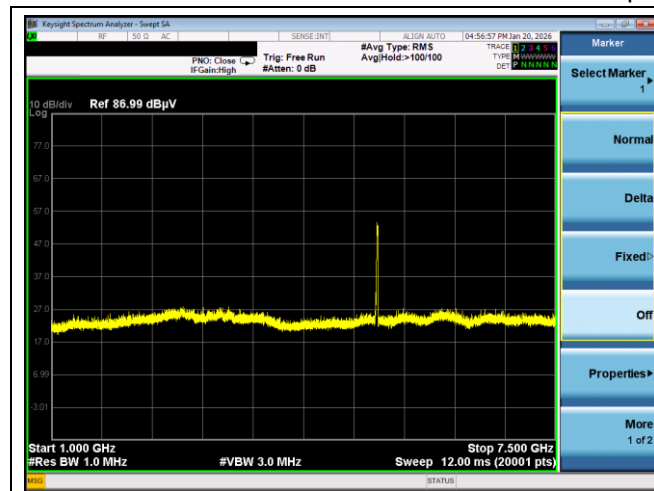
11ax_HE40_SU

Low channel Band edge (Peak) - UNII-1

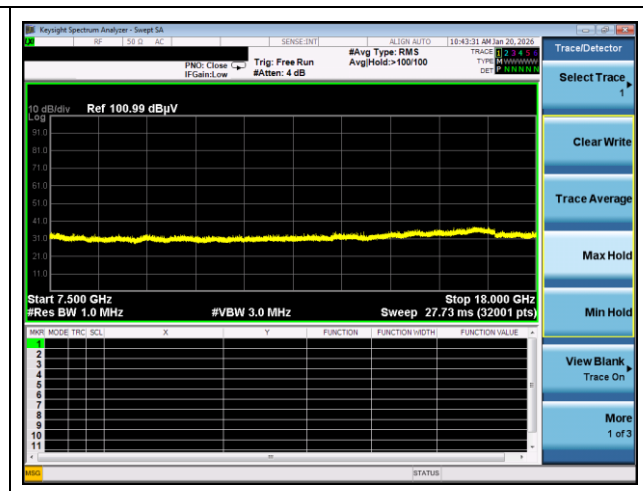
Low channel Band edge (Average) - UNII-1



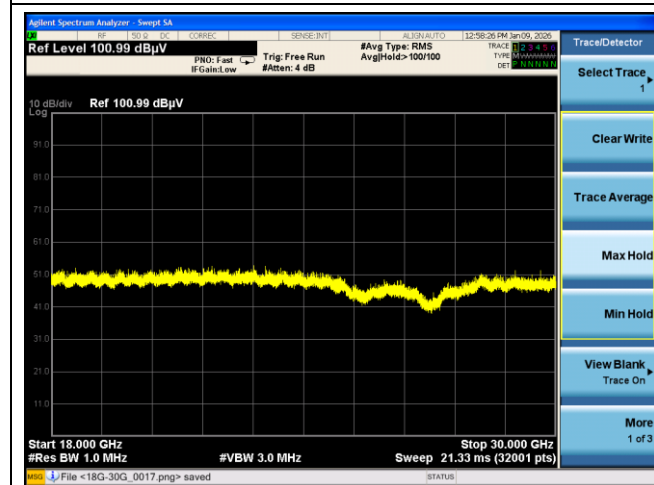
Radiated Spurious Emissions



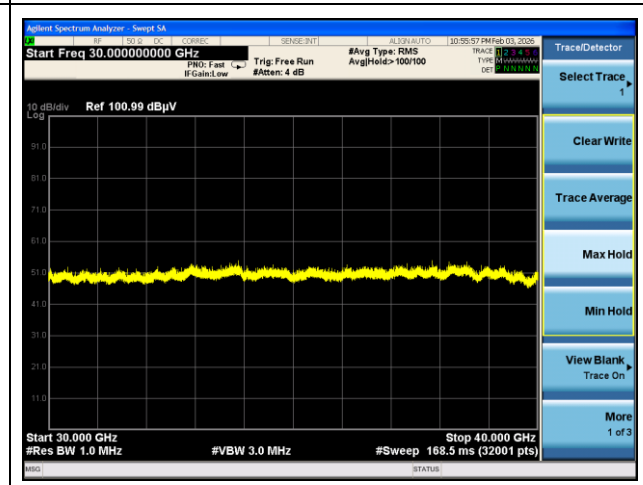
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz

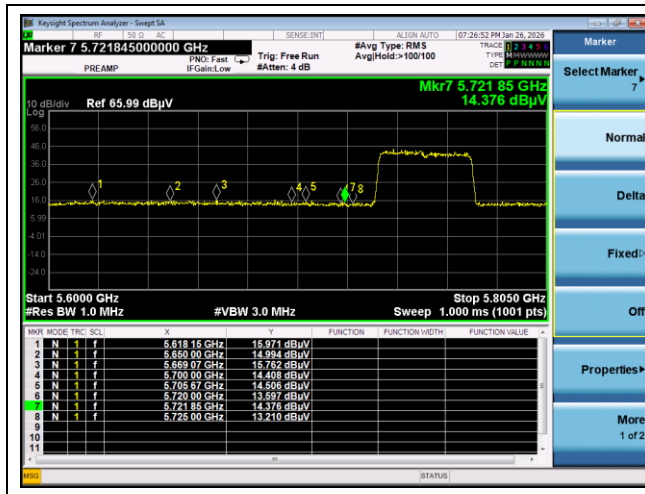


18 GHz ~ 30 GHz

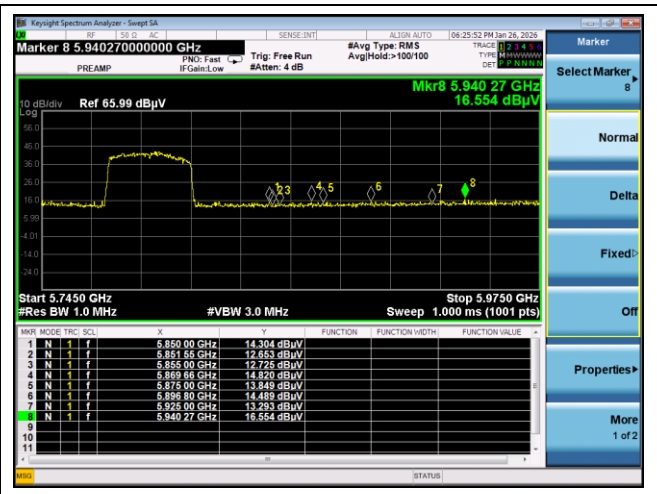


30 GHz ~ 40 GHz

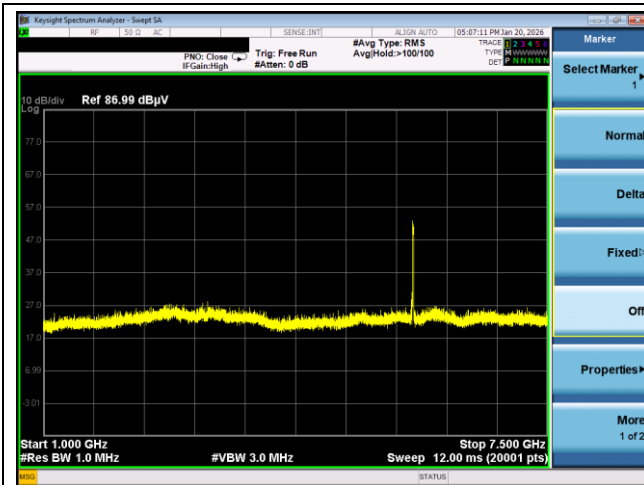
Low channel Band edge (Peak) - UNII-3



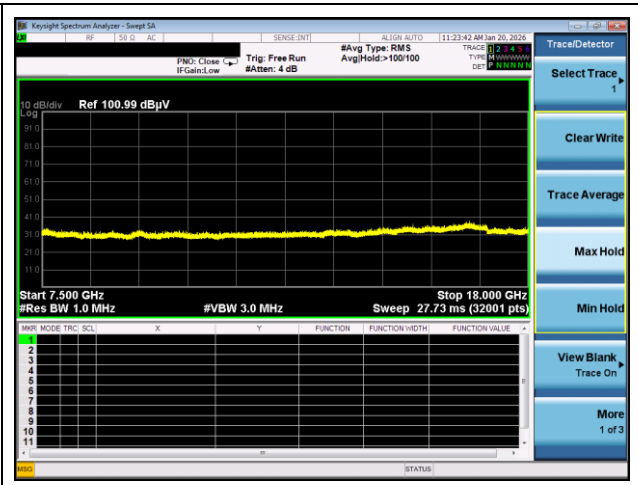
High channel Band edge (Peak) - UNII-3



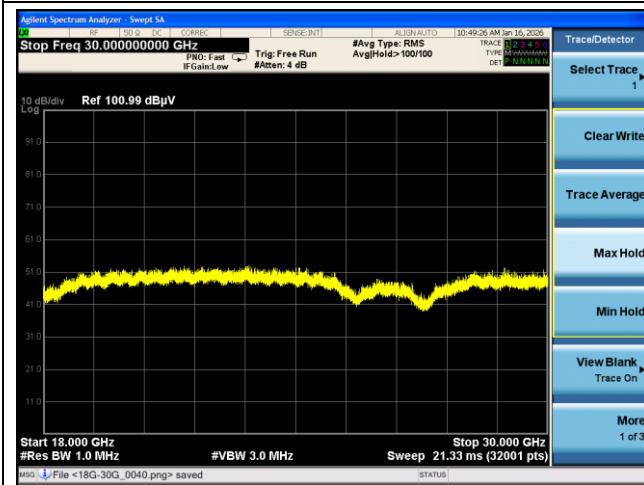
Radiated Spurious Emissions



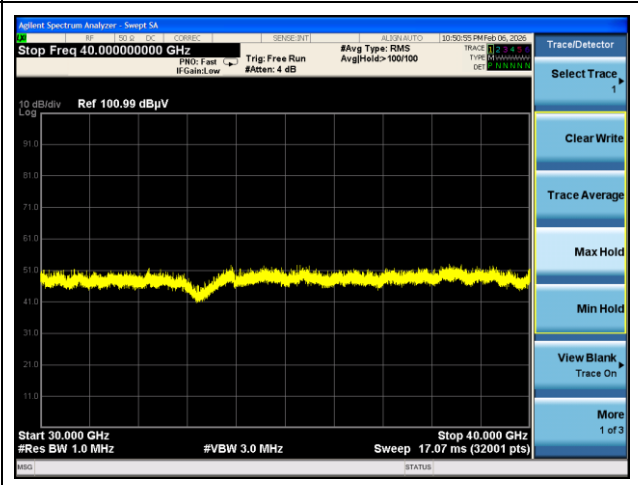
1 GHz ~ 7.5 GHz



7.5 GHz ~ 18 GHz



18 GHz ~ 30 GHz



30 GHz ~ 40 GHz