

APPENDIX

WIR124171B

FCC15.519 Data

§ 15.203 Antenna Requirement

*No data available for this section.

§ 15.203 / § 15.519(b) -10 dB Bandwidth

Fm =	7.425	GHz
FL =	7.16	GHz
FH =	7.76	GHz
-10dB BW	600	MHz

Table 1. -10dB bandwidth calc

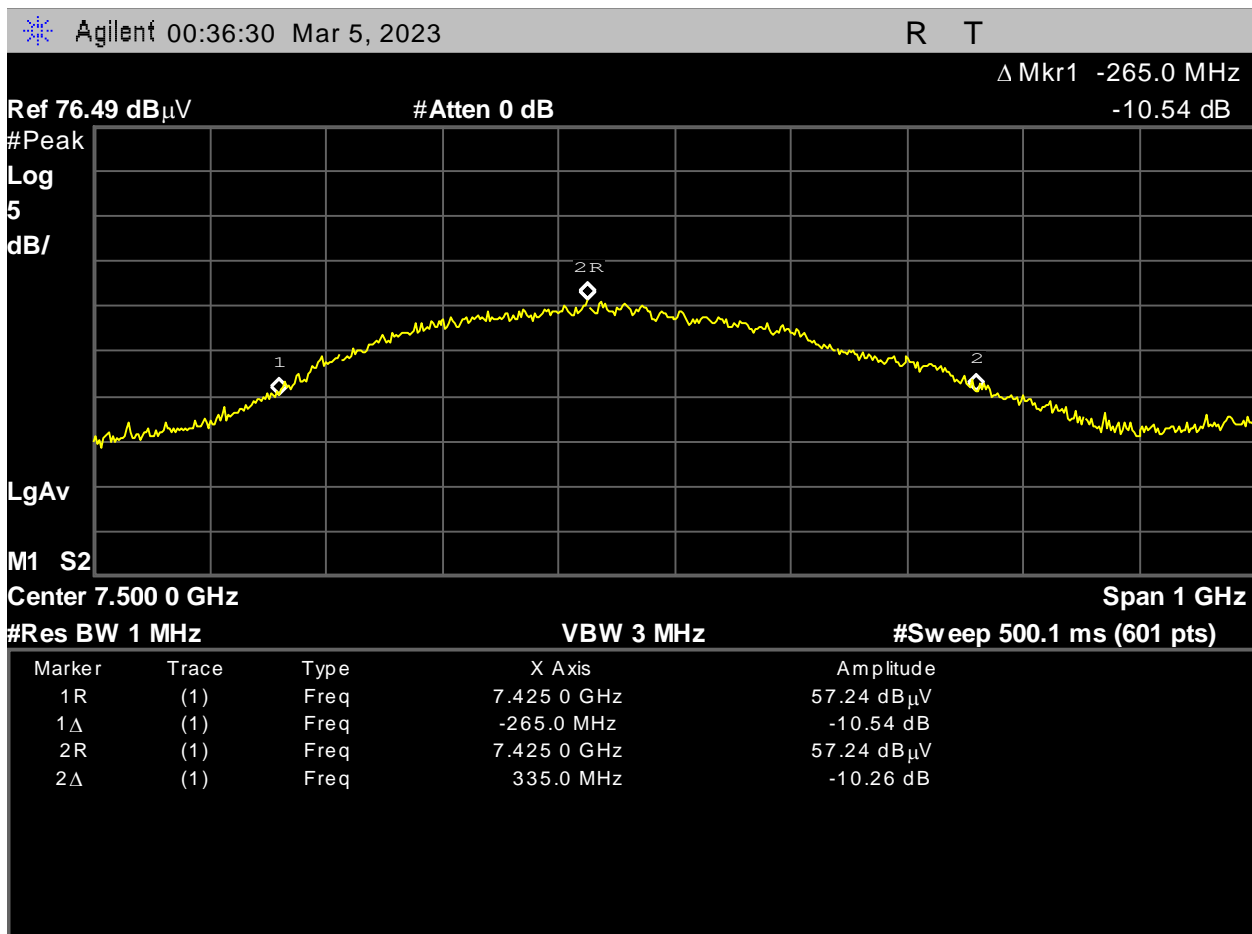


Figure 1. -10dB BW

§ 15.519(c) Radiated Emissions

124171

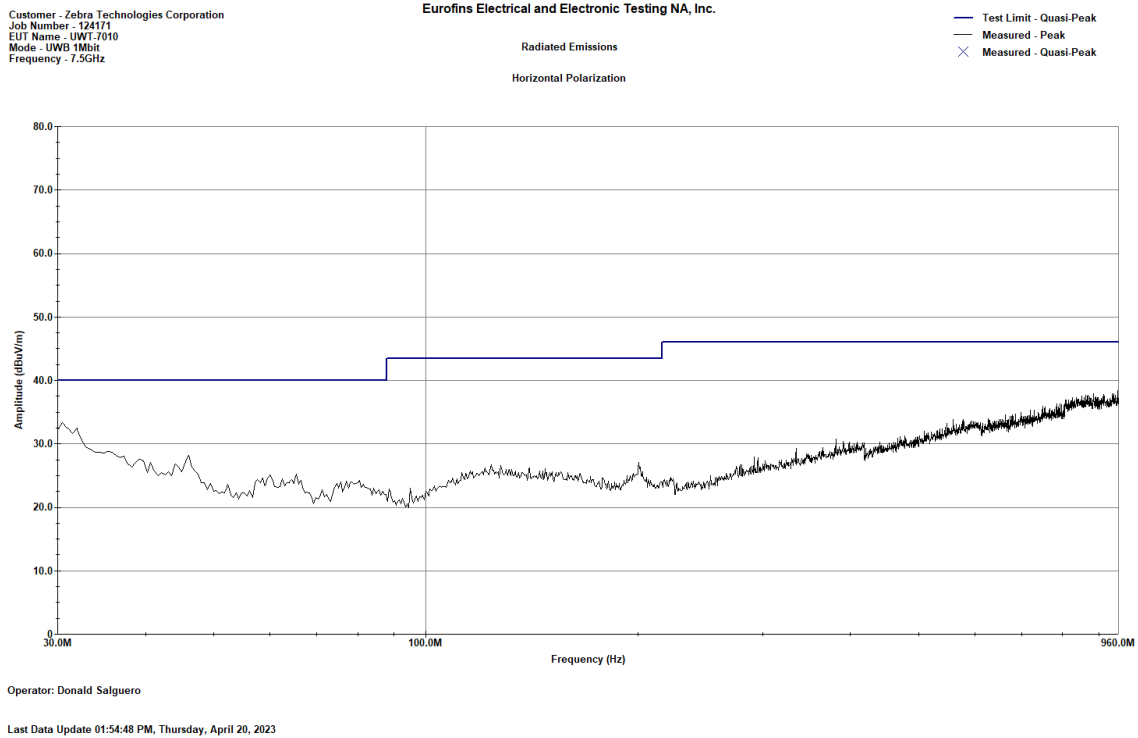


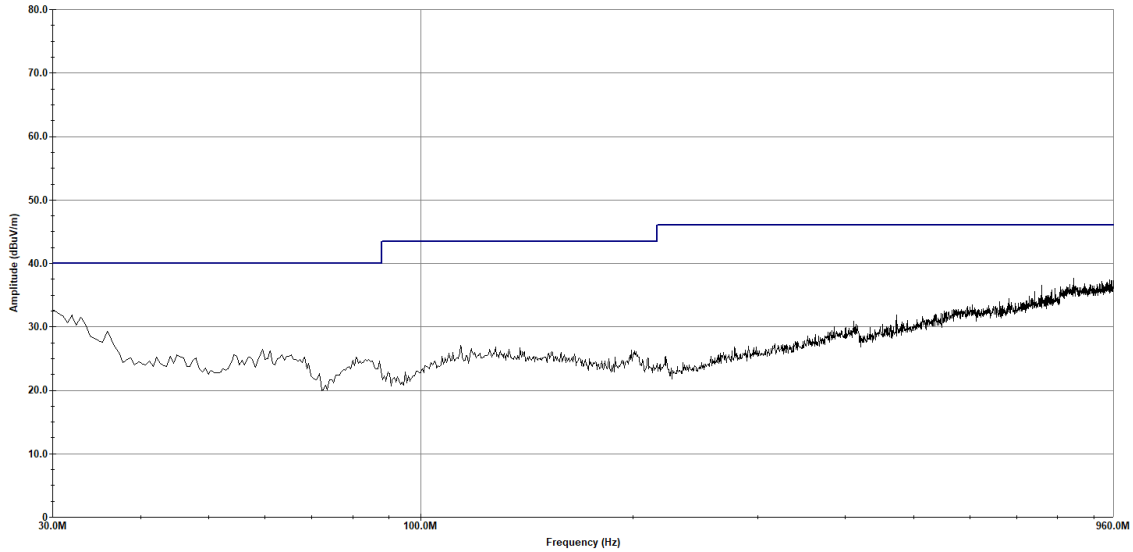
Figure 2. 15.209 - Radiated Emissions, UWB 1 Mbit, 30 MHz to 960 MHz, Horizontal

Customer - Zebra Technologies Corporation
Job Number - 124171
EUT Name - UWT.7010
Mode - UWB 1Mbit
Frequency - 7.5GHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions
Vertical Polarization

— Test Limit - Quasi-Peak
— Measured - Peak
× Measured - Quasi-Peak



Operator: Donald Salguero

Last Data Update 02:00:09 PM, Thursday, April 20, 2023

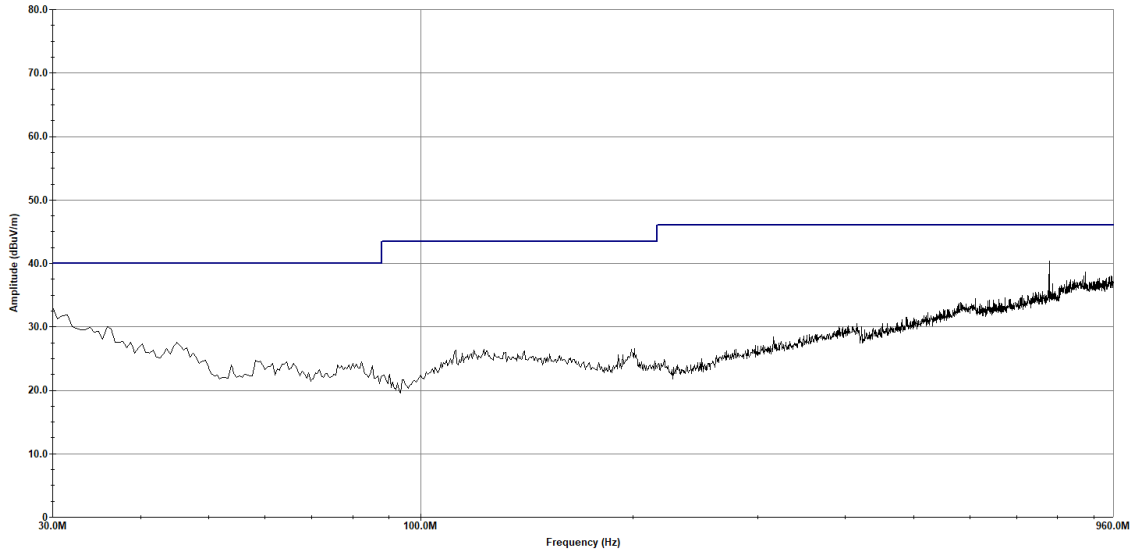
Figure 3. 15.209 - Radiated Emissions, UWB 1 Mbit, 30 MHz to 960 MHz, Vertical

Customer - Zebra Technologies Corporation
 Job Number - 124171
 EUT Name - UWT.7010
 Mode - UWB 2Mbit
 Frequency - 7.5GHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions
 Horizontal Polarization

— Test Limit - Quasi-Peak
 — Measured - Peak
 × Measured - Quasi-Peak



Operator: Donald Salguero

Last Data Update 02:10:36 PM, Thursday, April 20, 2023

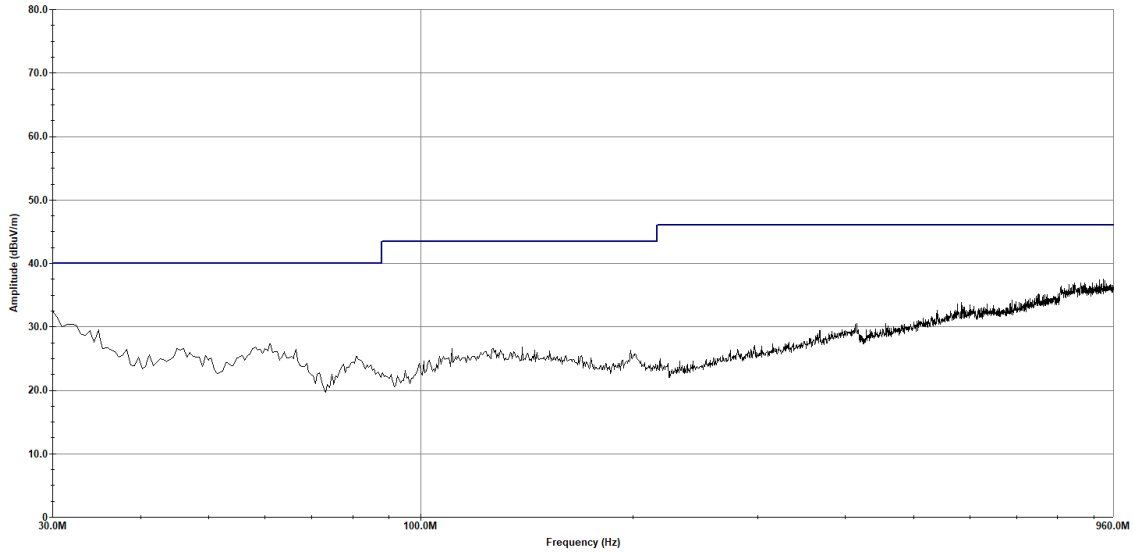
Figure 4. 15.209 - Radiated Emissions, UWB 2 Mbit, 30 MHz to 960 MHz, Horizontal

Customer - Zebra Technologies Corporation
 Job Number - 124171
 EUT Name - UWT.7010
 Mode - UWB 2Mbit
 Frequency - 7.5GHz

Eurofins Electrical and Electronic Testing NA, Inc.

Radiated Emissions
 Vertical Polarization

— Test Limit - Quasi-Peak
 — Measured - Peak
 × Measured - Quasi-Peak



Operator: Donald Salguero

Last Data Update 02:15:53 PM, Thursday, April 20, 2023

Figure 5. 15.209 - Radiated Emissions, UWB 2 Mbit, 30 MHz to 960 MHz, Vertical

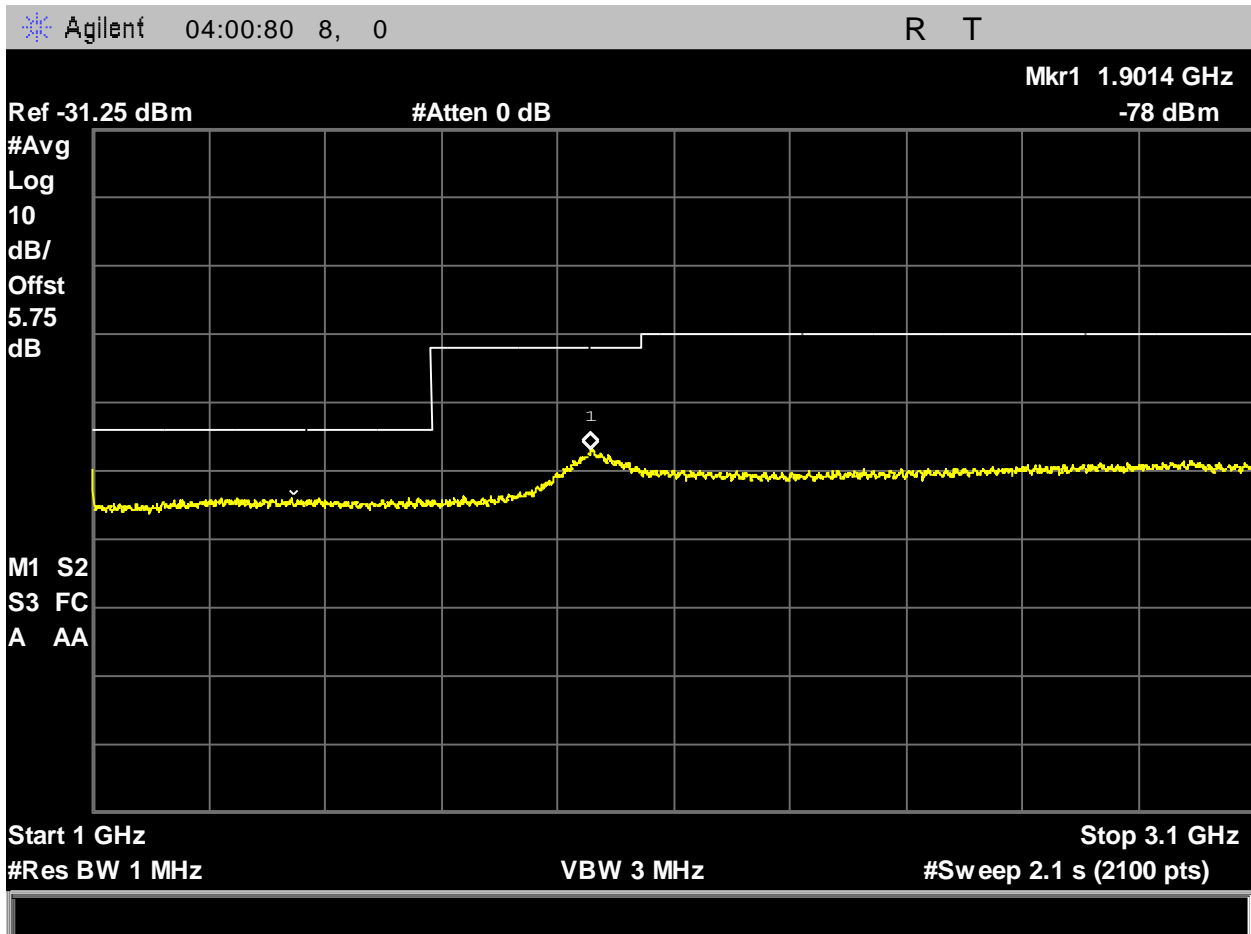


Figure 6. UWT-7010_Radiated Spurious Emissions_1mbp_1000-3100 MHz_H

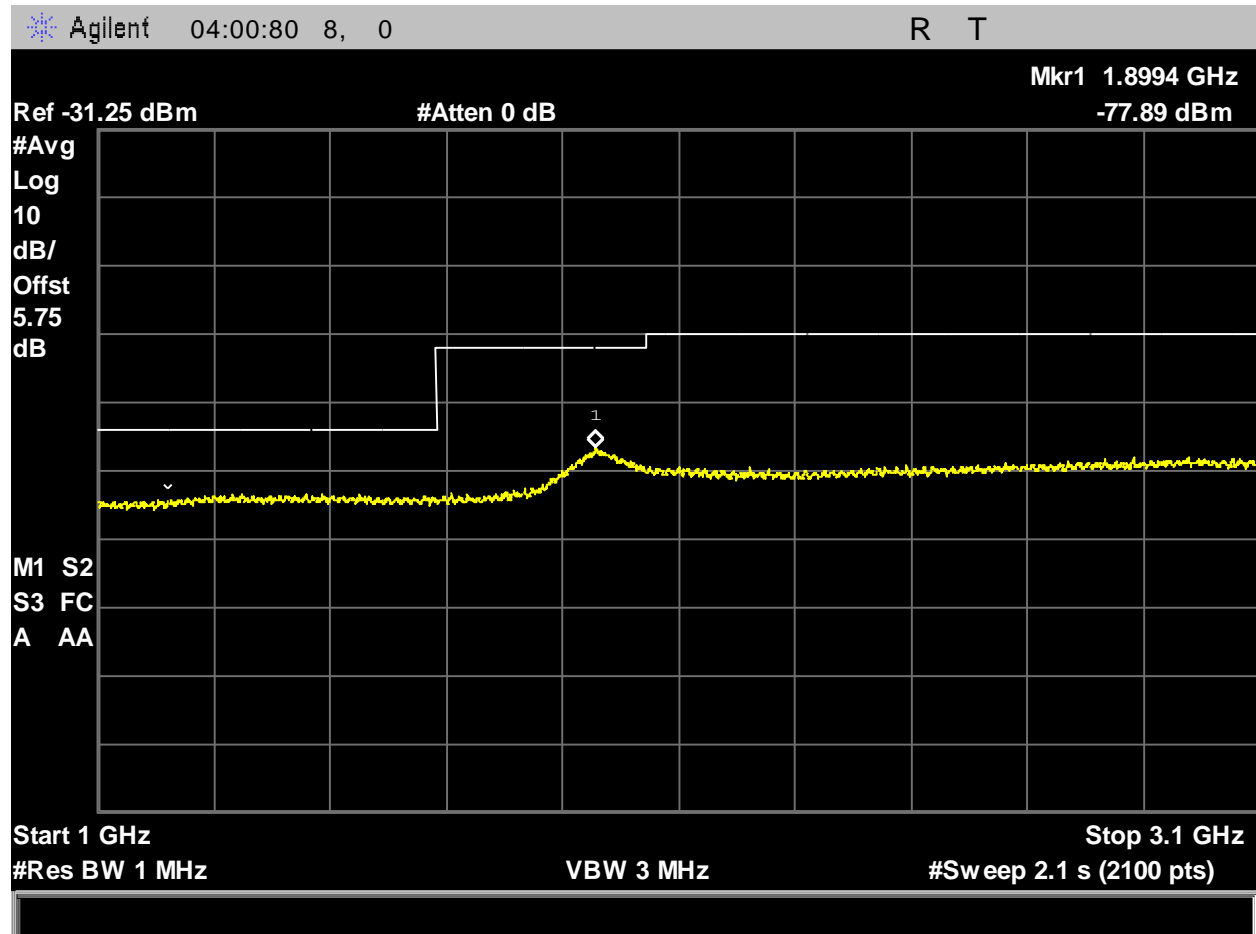


Figure 7. UWT-7010_Radiated Spurious Emissions_1mbp_1000-3100 MHz_V

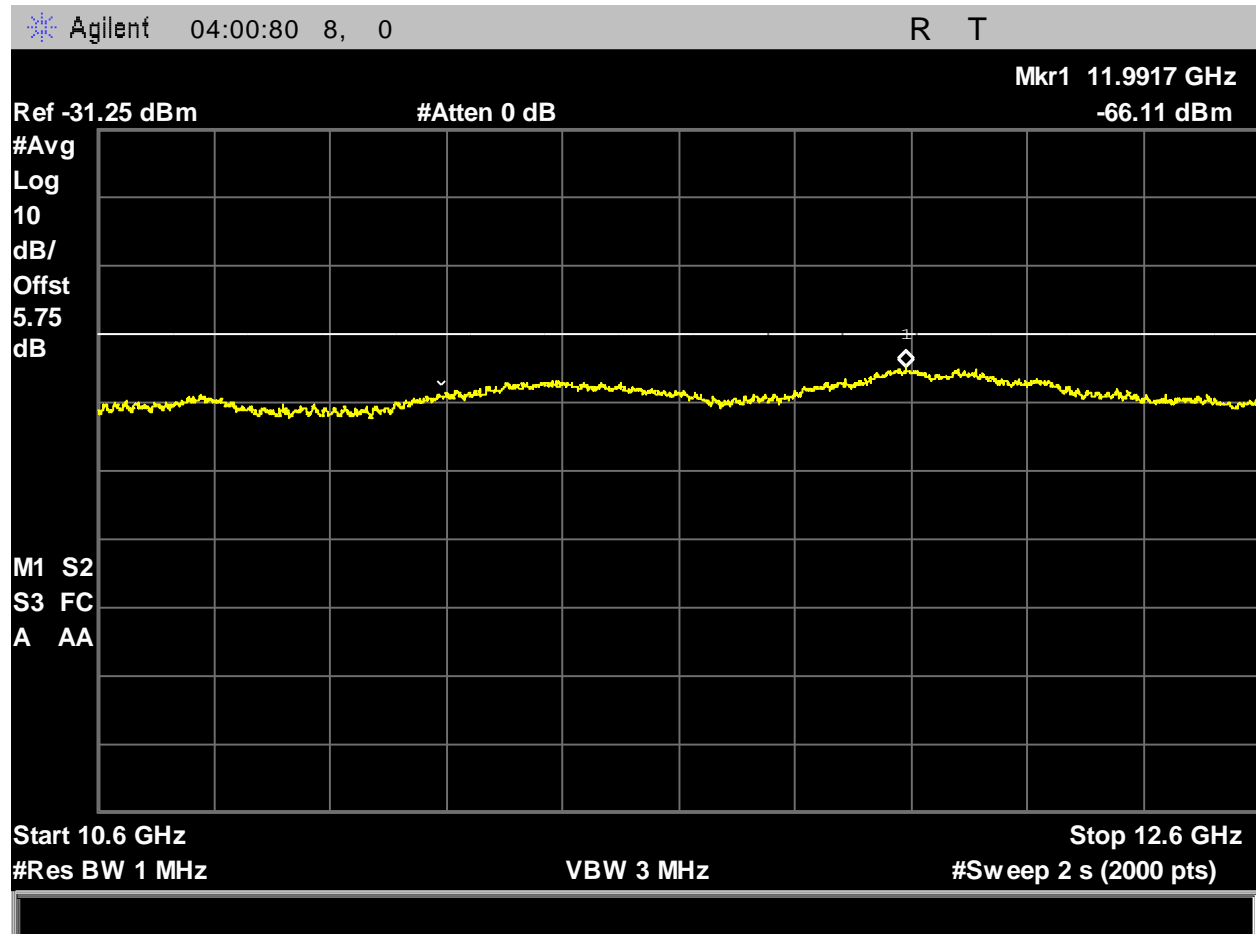


Figure 8. UWT-7010_Radiated Spurious Emissions_1mbp_10600-12600 MHz_H

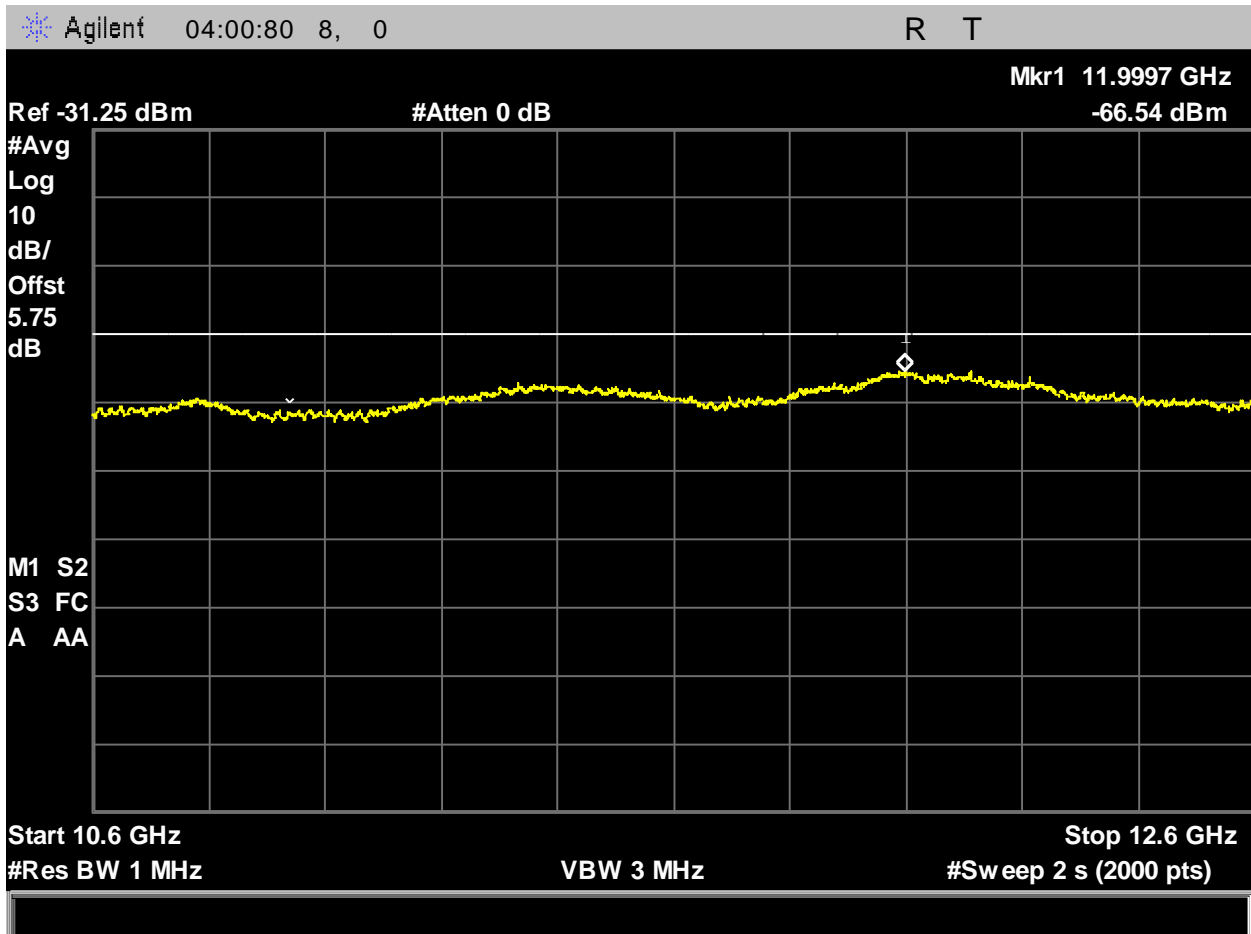


Figure 9. UWT-7010_Radiated Spurious Emissions_1mbp_10600-12600 MHz_V

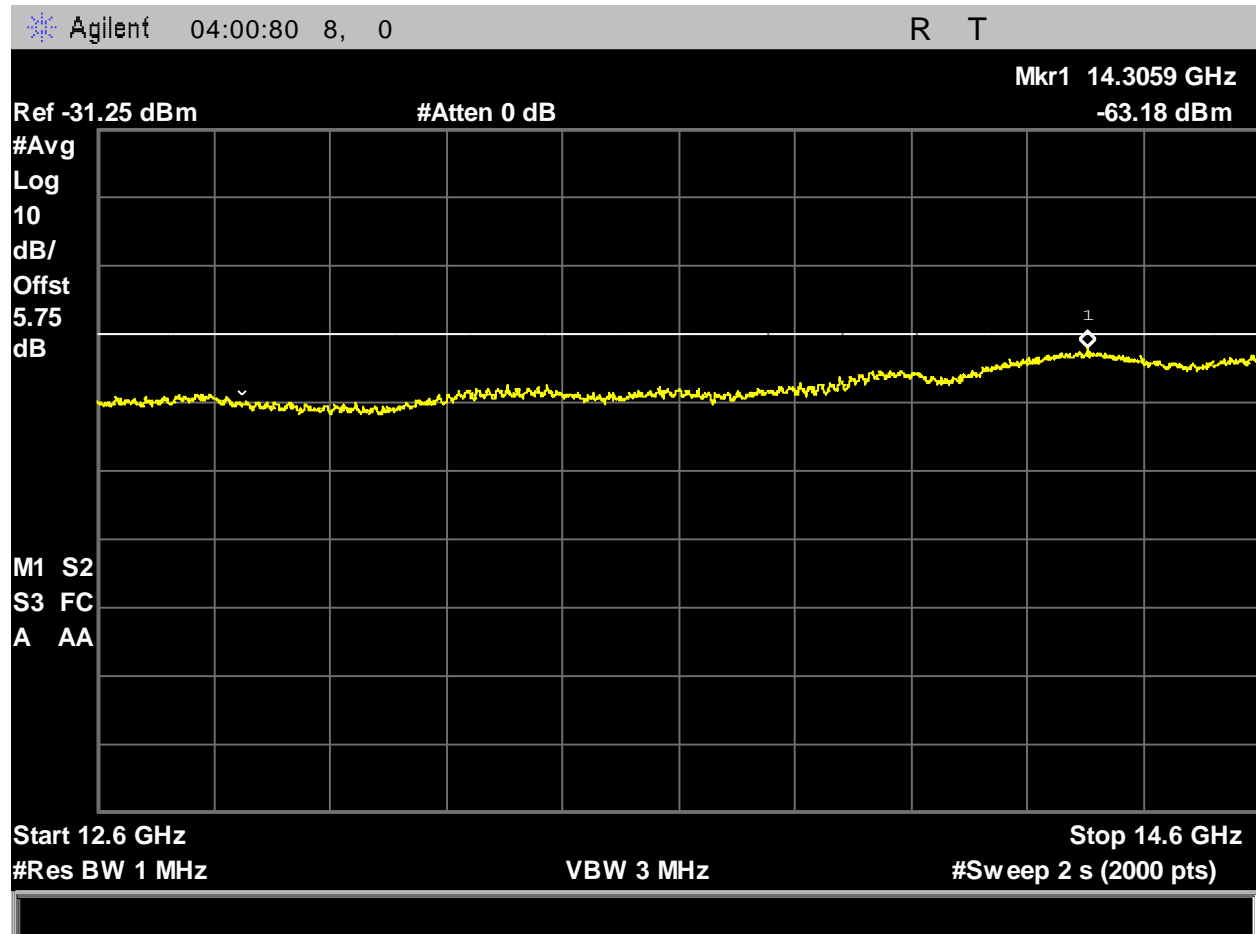


Figure 10. UWT-7010_Radiated Spurious Emissions_1mbp_12600-14600 MHz_H

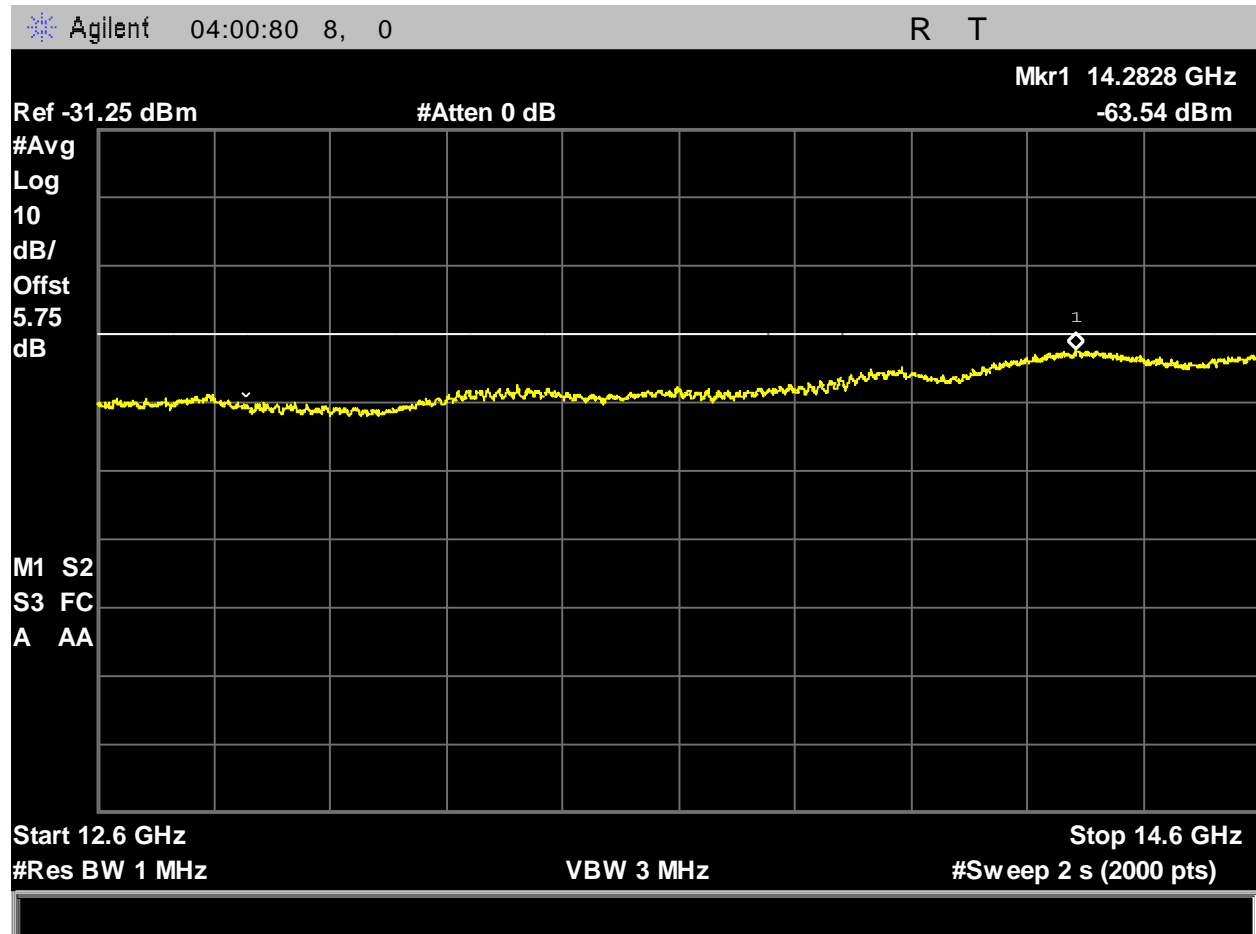


Figure 11. UWT-7010_Radiated Spurious Emissions_1mbp_12600-14600 MHz_V

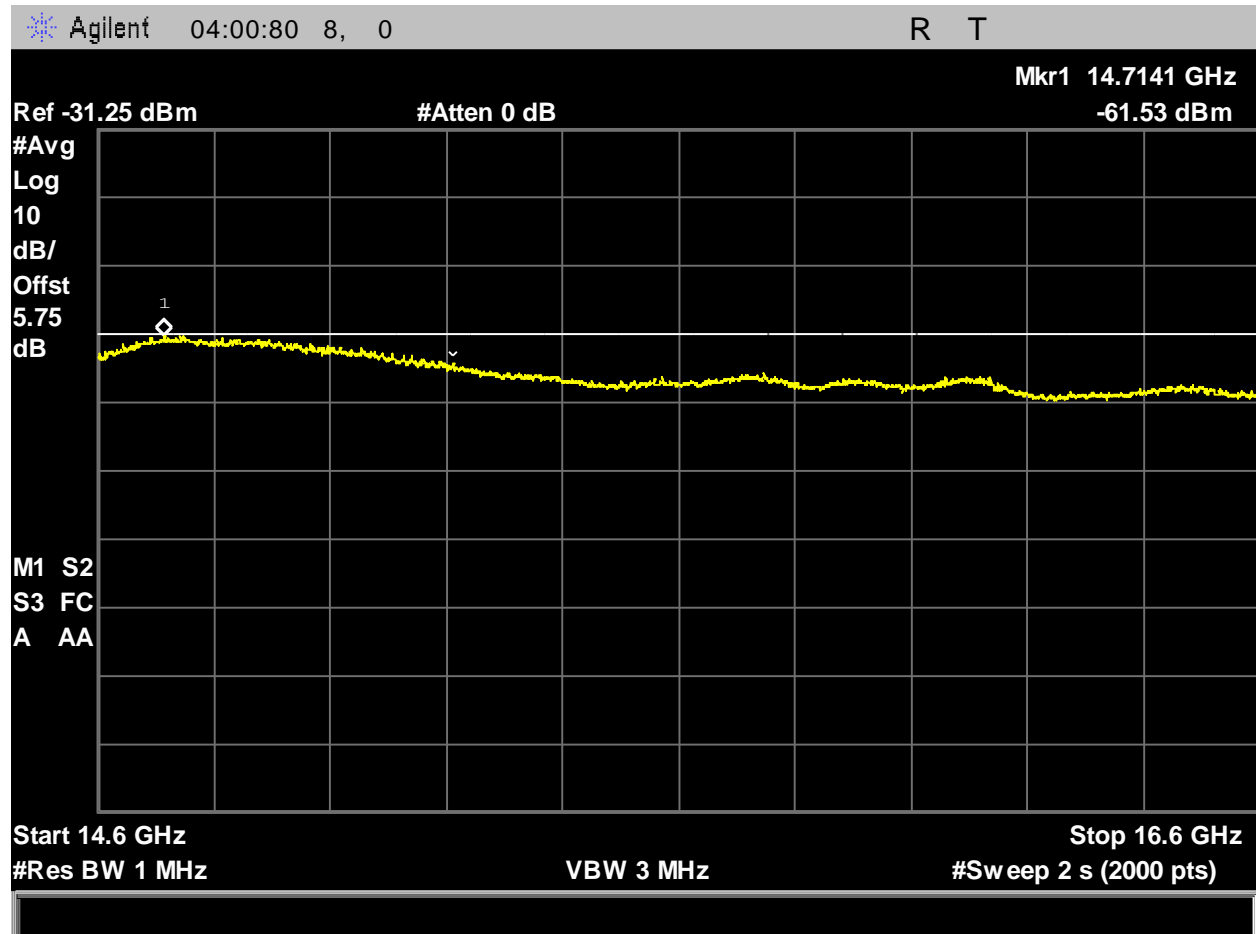


Figure 12. UWT-7010_Radiated Spurious Emissions_1mbp_14600-16600 MHz_H

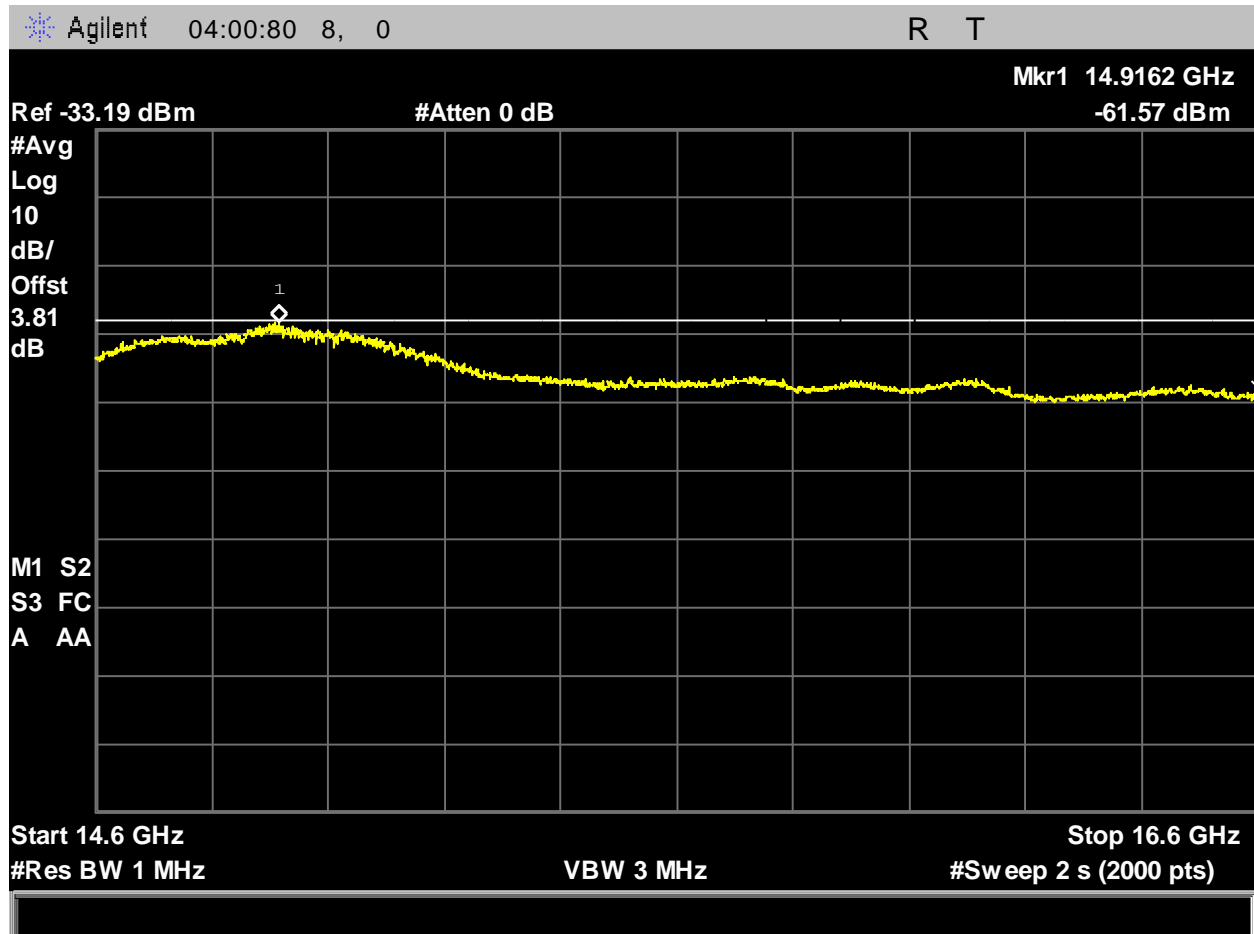


Figure 13. UWT-7010_Radiated Spurious Emissions_1mbp_14600-16600 MHz_V

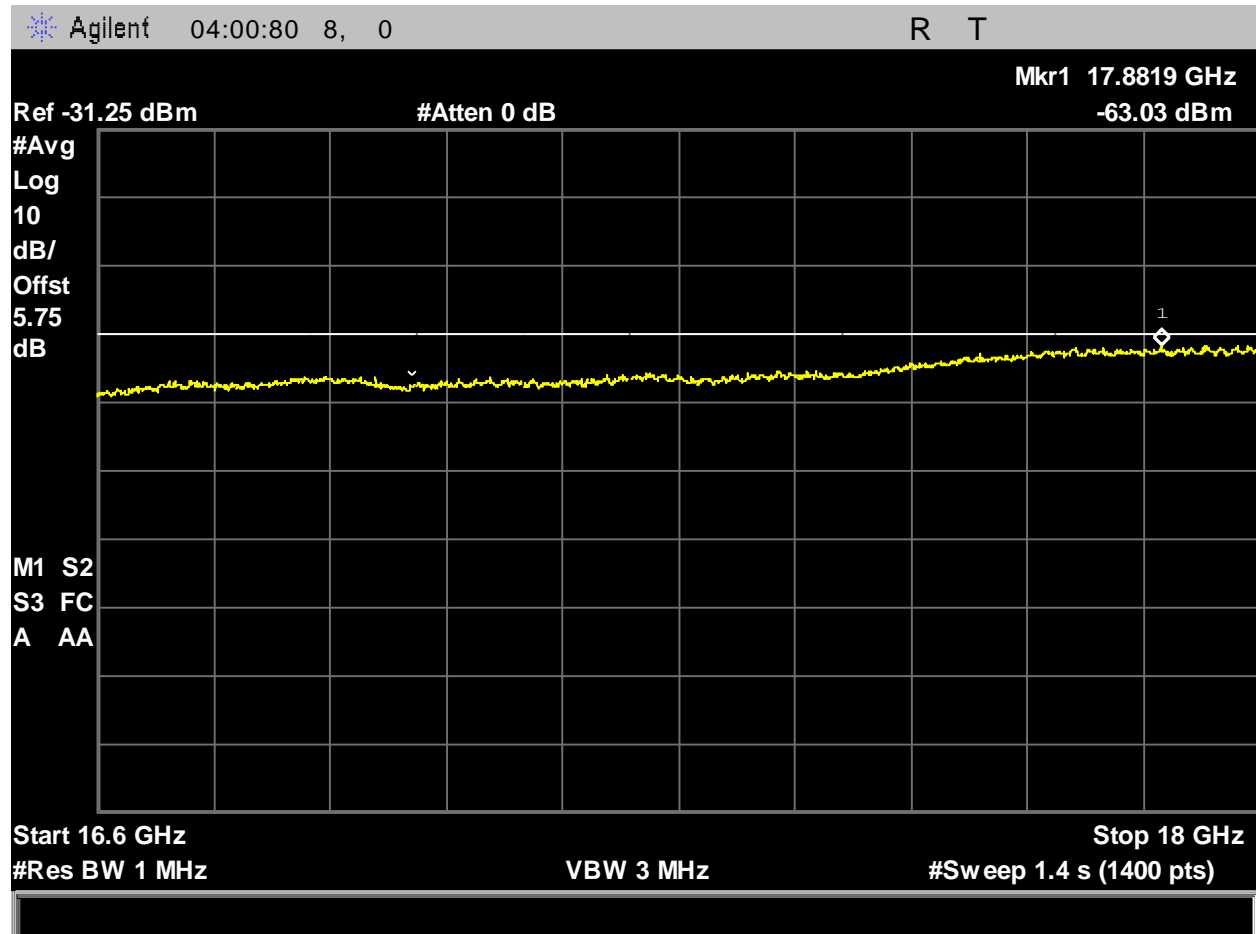


Figure 14. UWT-7010_Radiated Spurious Emissions_1mbp_16600-18000 MHz_H

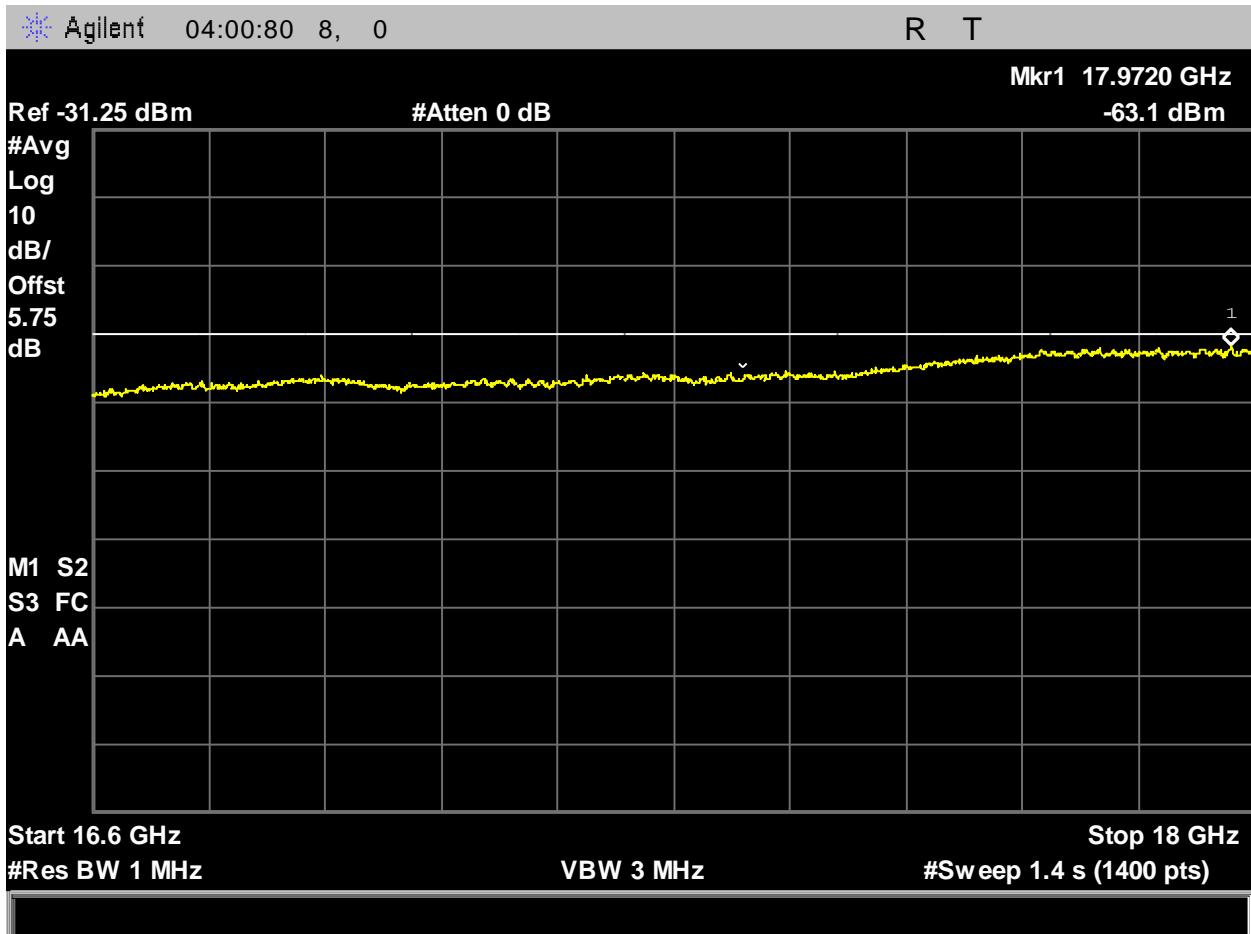


Figure 15. UWT-7010_Radiated Spurious Emissions_1mbp_16600-18000 MHz_V

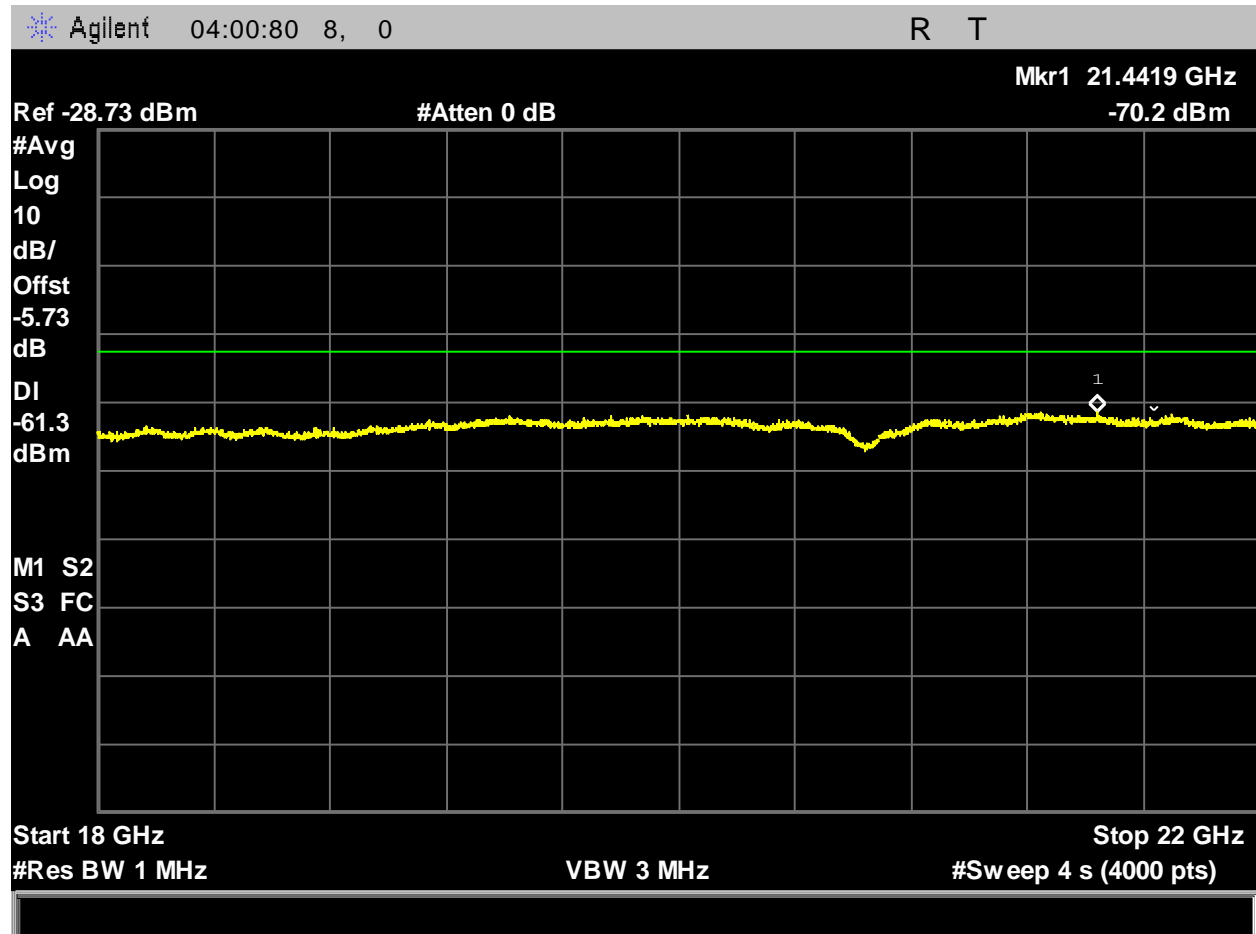


Figure 16. UWT-7010_Radiated Spurious Emissions_1mbp_18-22 GHz_H

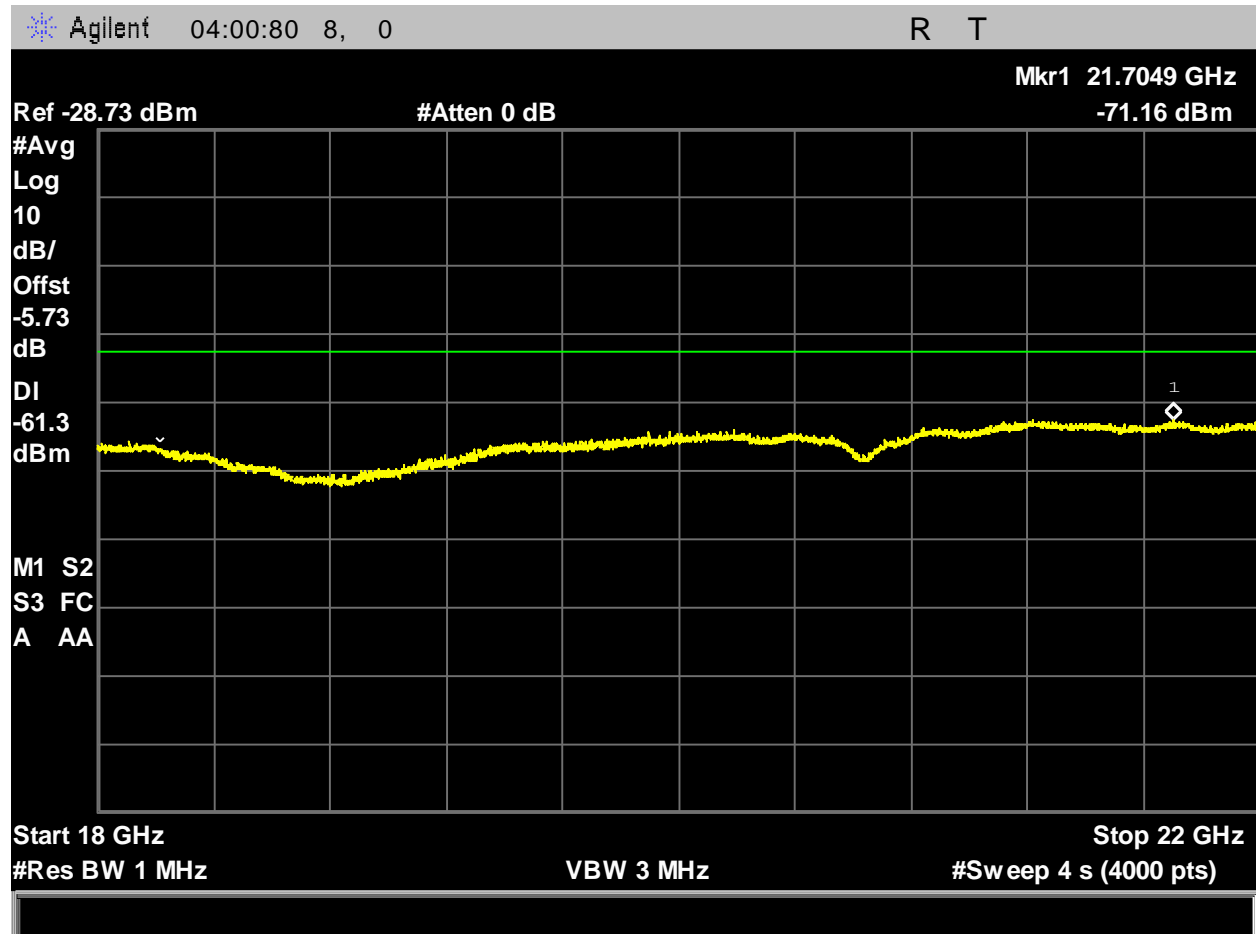


Figure 17. UWT-7010_Radiated Spurious Emissions_1mbp_18-22 GHz_V

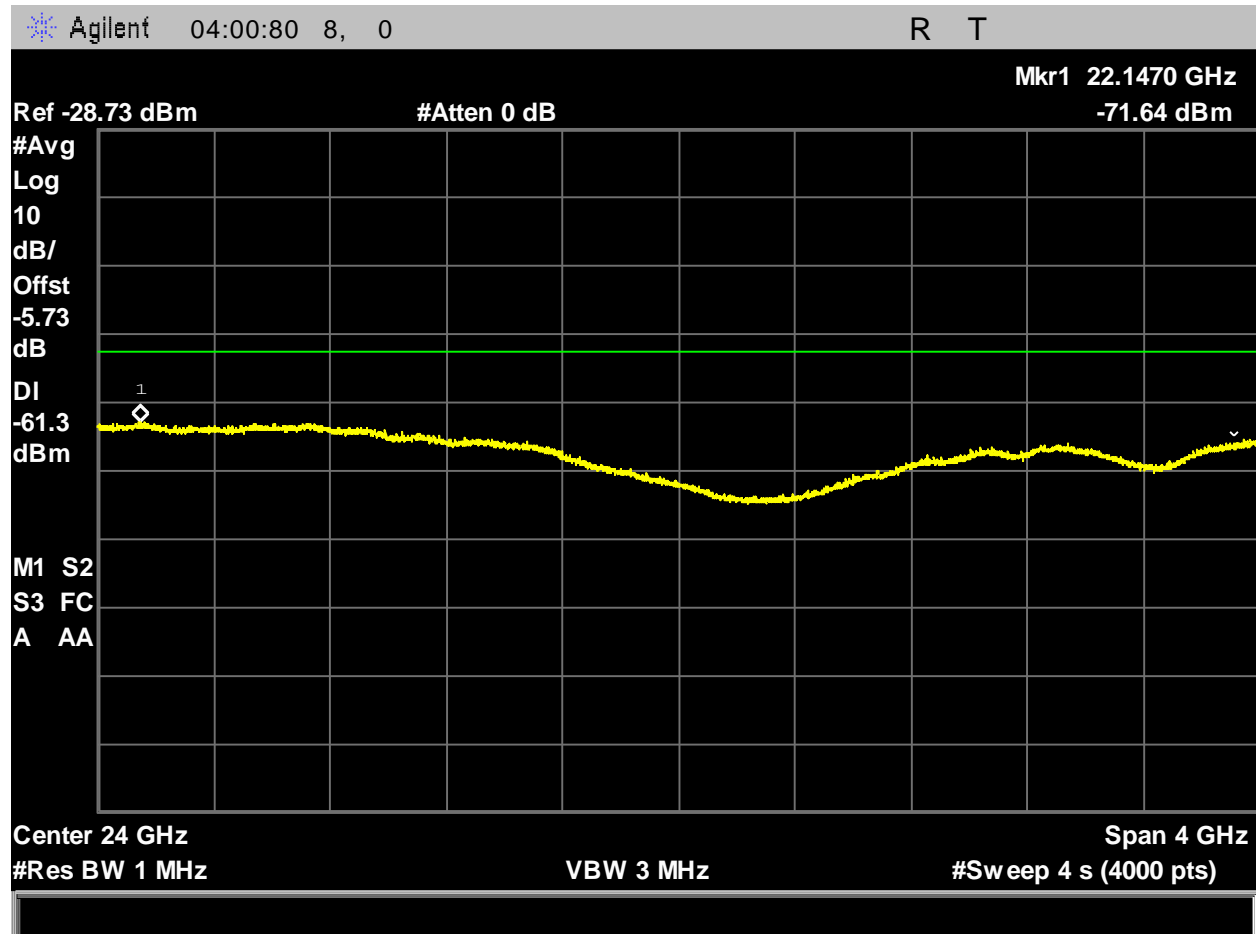


Figure 18. UWT-7010_Radiated Spurious Emissions_1mbp_22-26 GHz_H

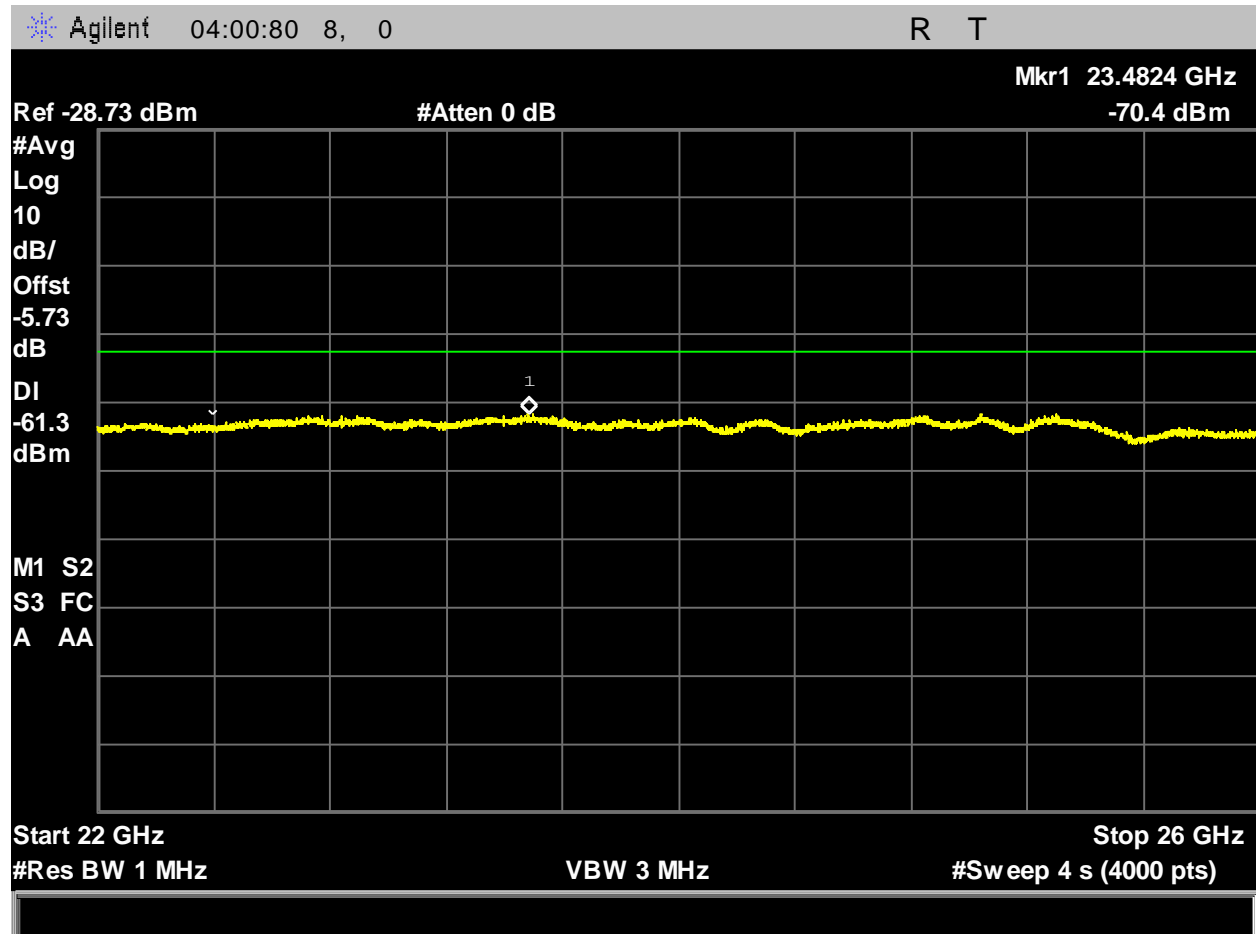


Figure 19. UWT-7010_Radiated Spurious Emissions_1mbp_22-26 GHz_V

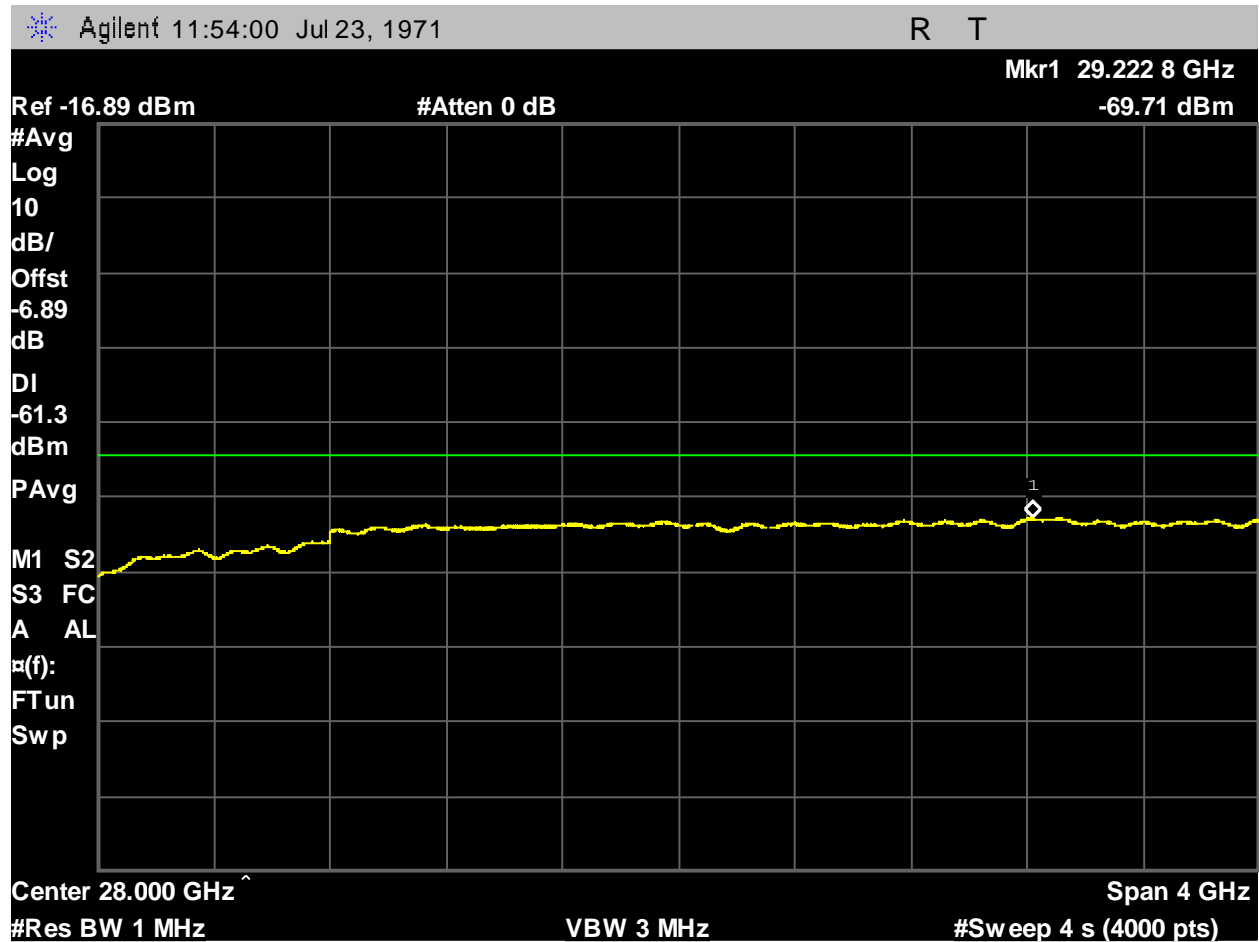


Figure 20. UWT-7010_Radiated Spurious Emissions_1mbp_26-30 GHz_H

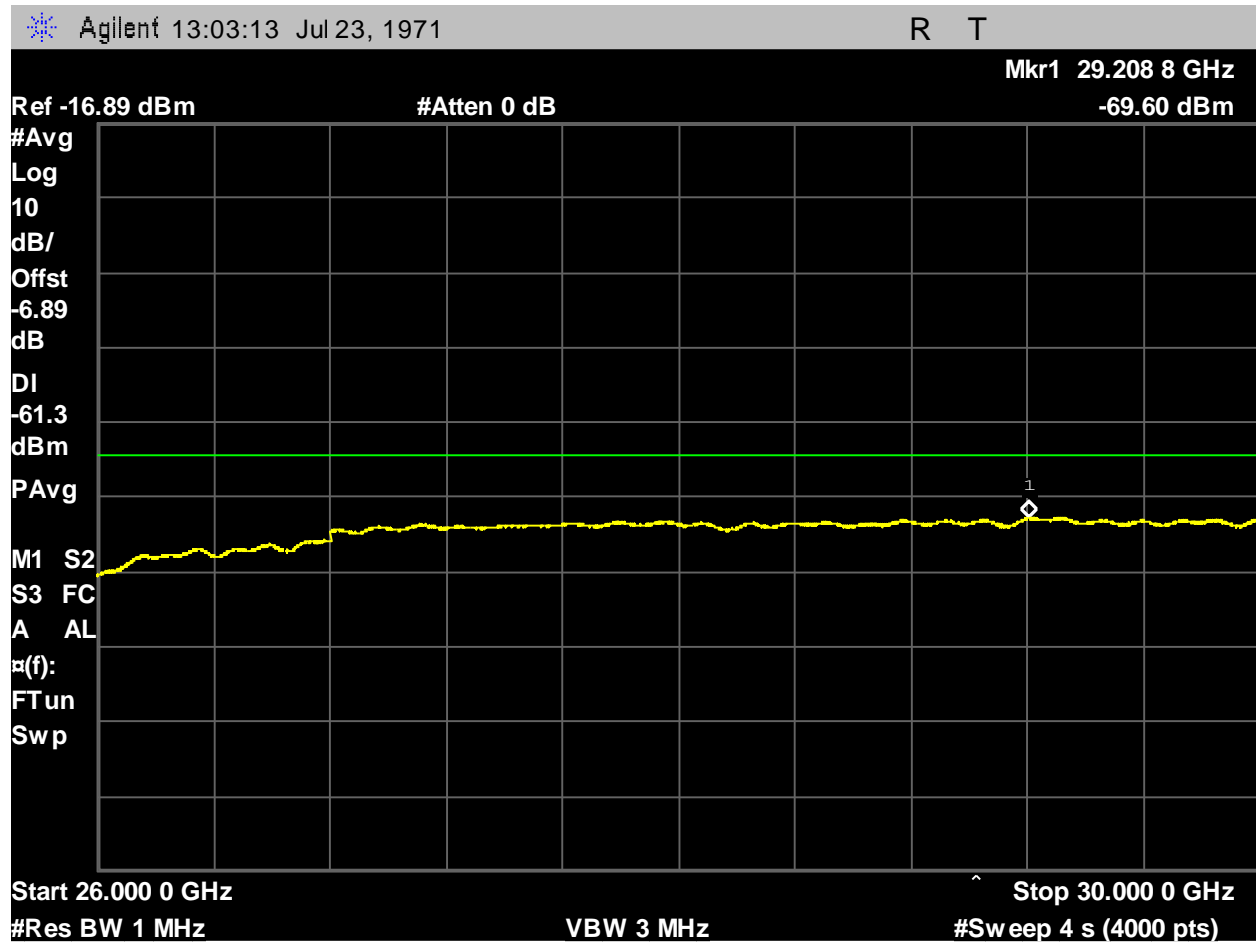


Figure 21. UWT-7010_Radiated Spurious Emissions_1mbp_26-30 GHz_V

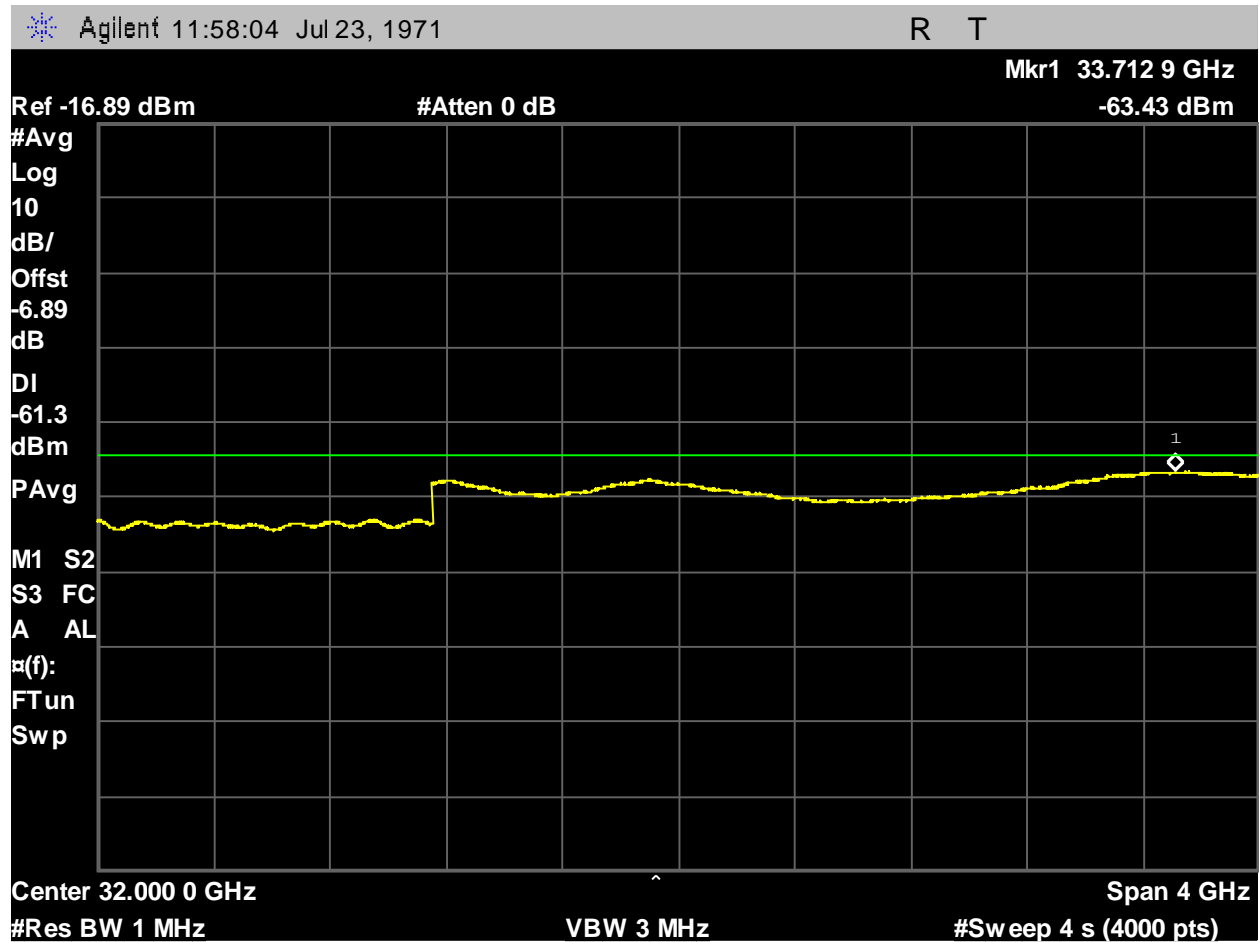


Figure 22. UWT-7010_Radiated Spurious Emissions_1mbp_30-34 GHz_H

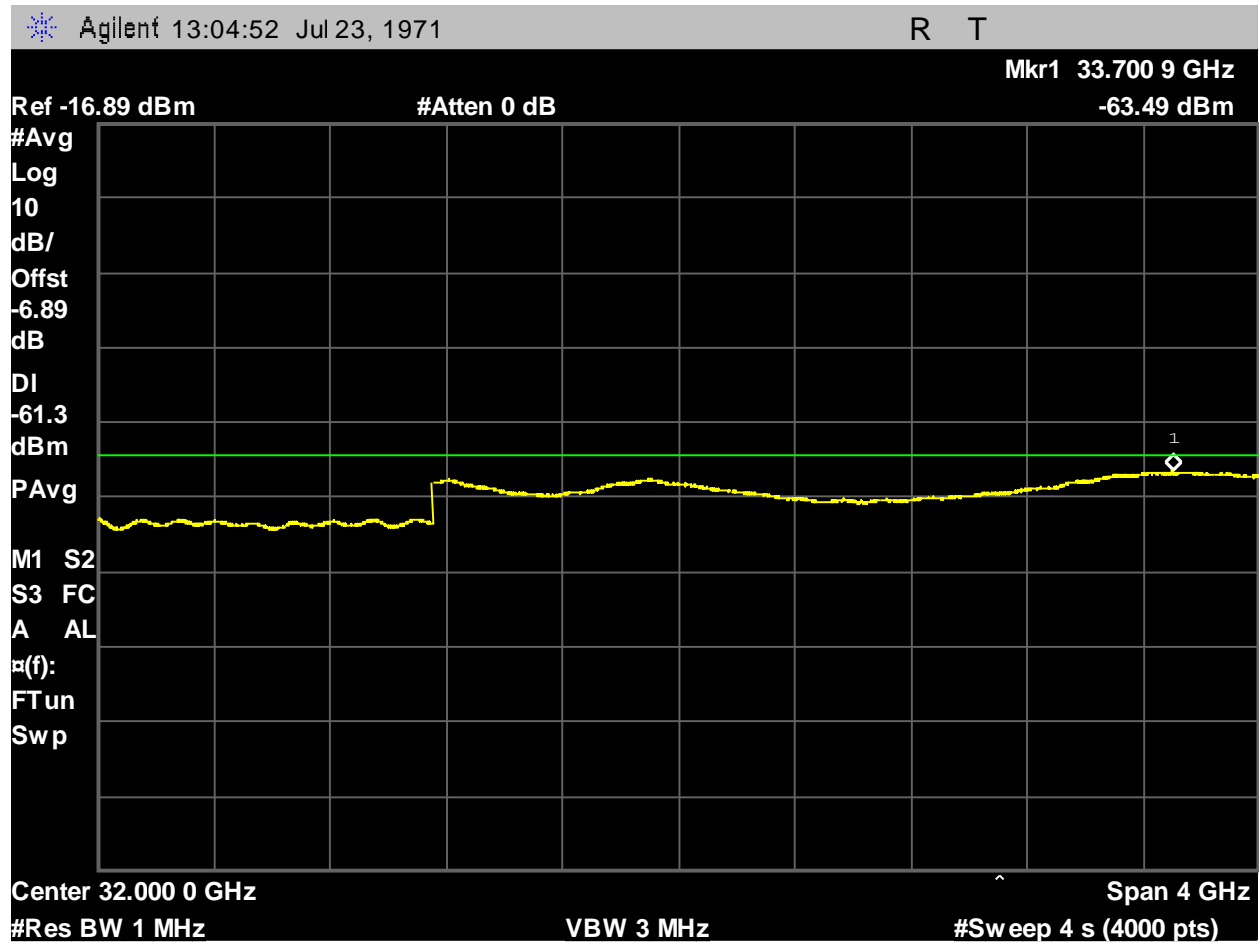


Figure 23. UWT-7010_Radiated Spurious Emissions_1mbp_30-34 GHz_V

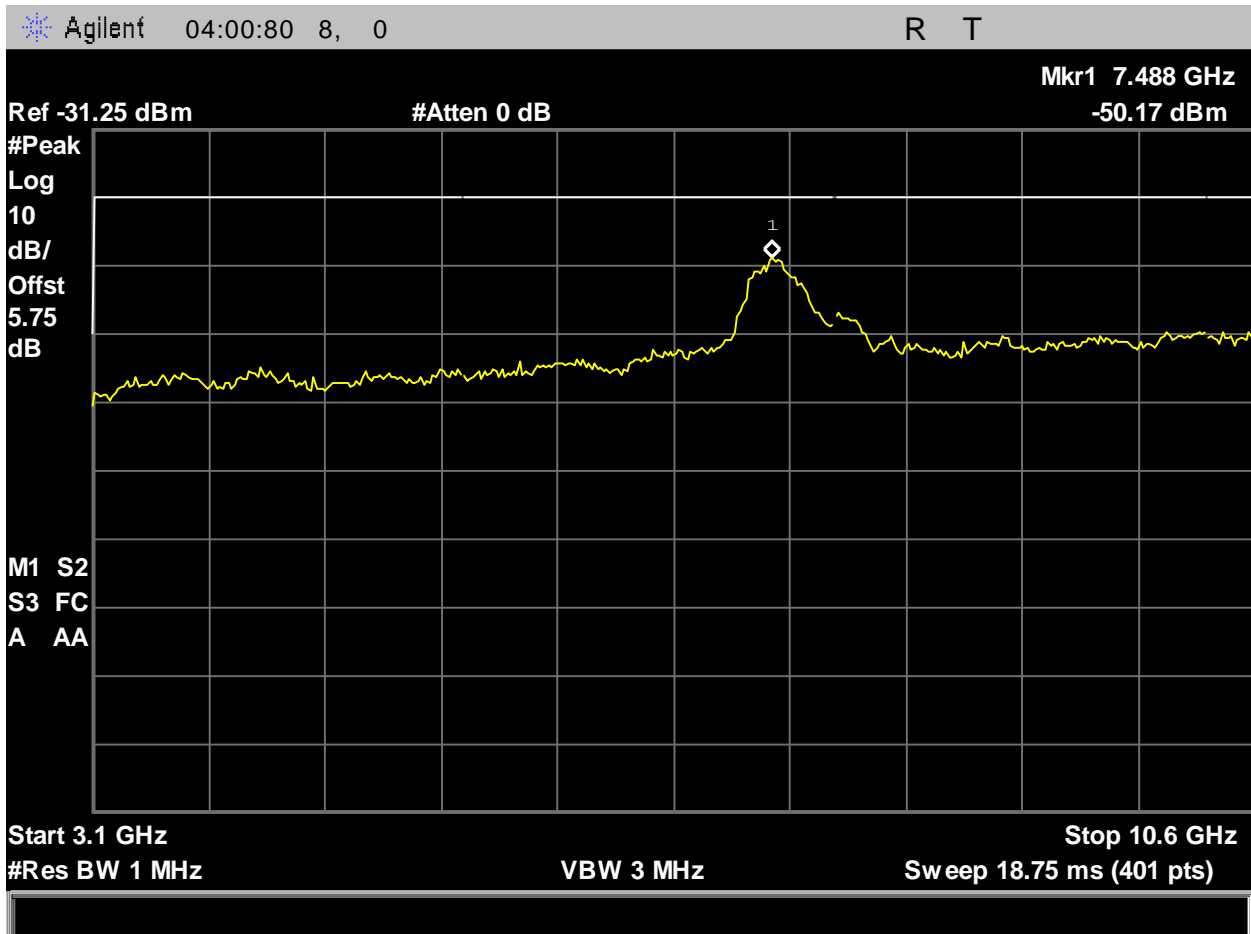


Figure 24. UWT-7010_Radiated Spurious Emissions_1mbp_3100-10600 MHz_H

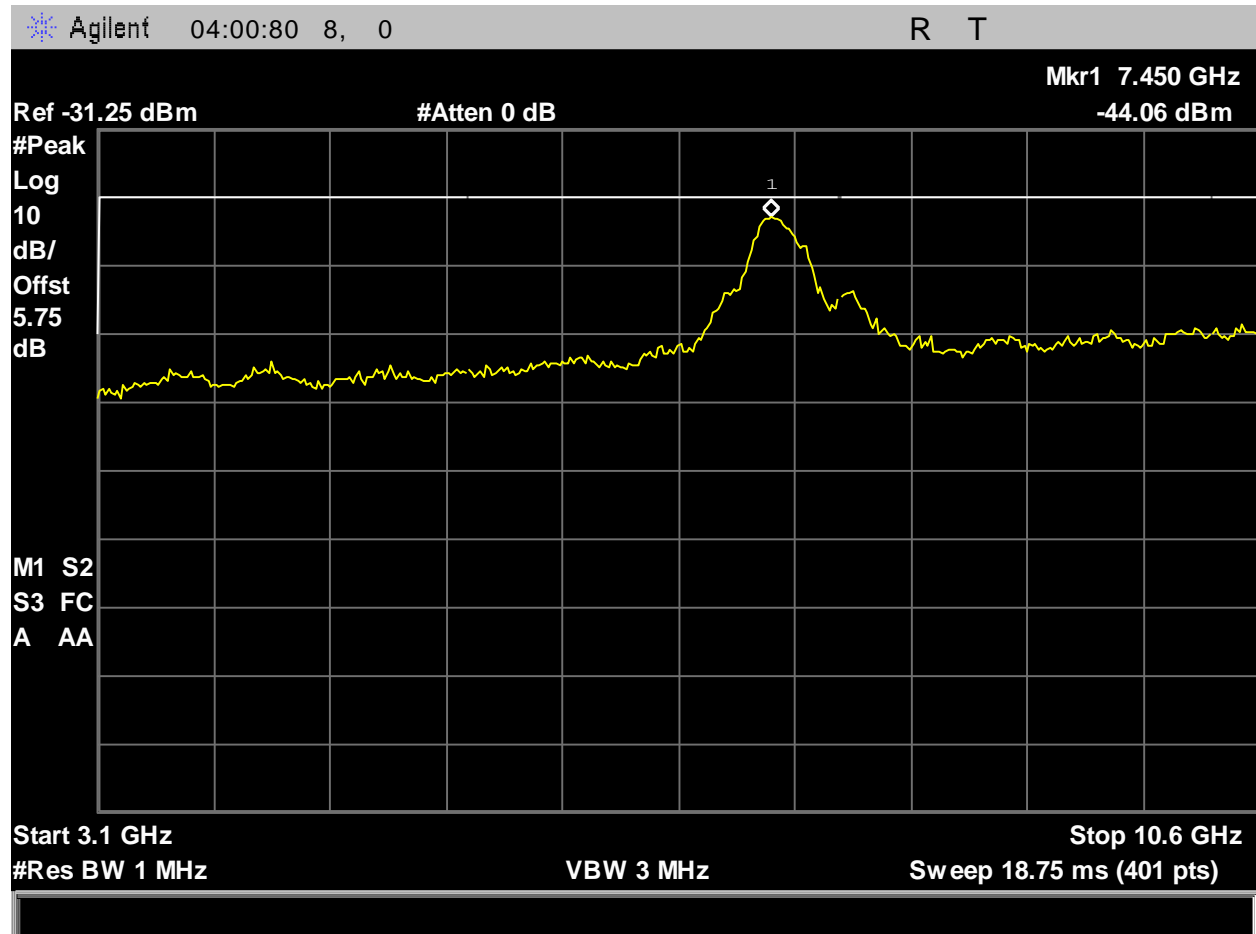


Figure 25. UWT-7010_Radiated Spurious Emissions_1mbp_3100-10600 MHz_V

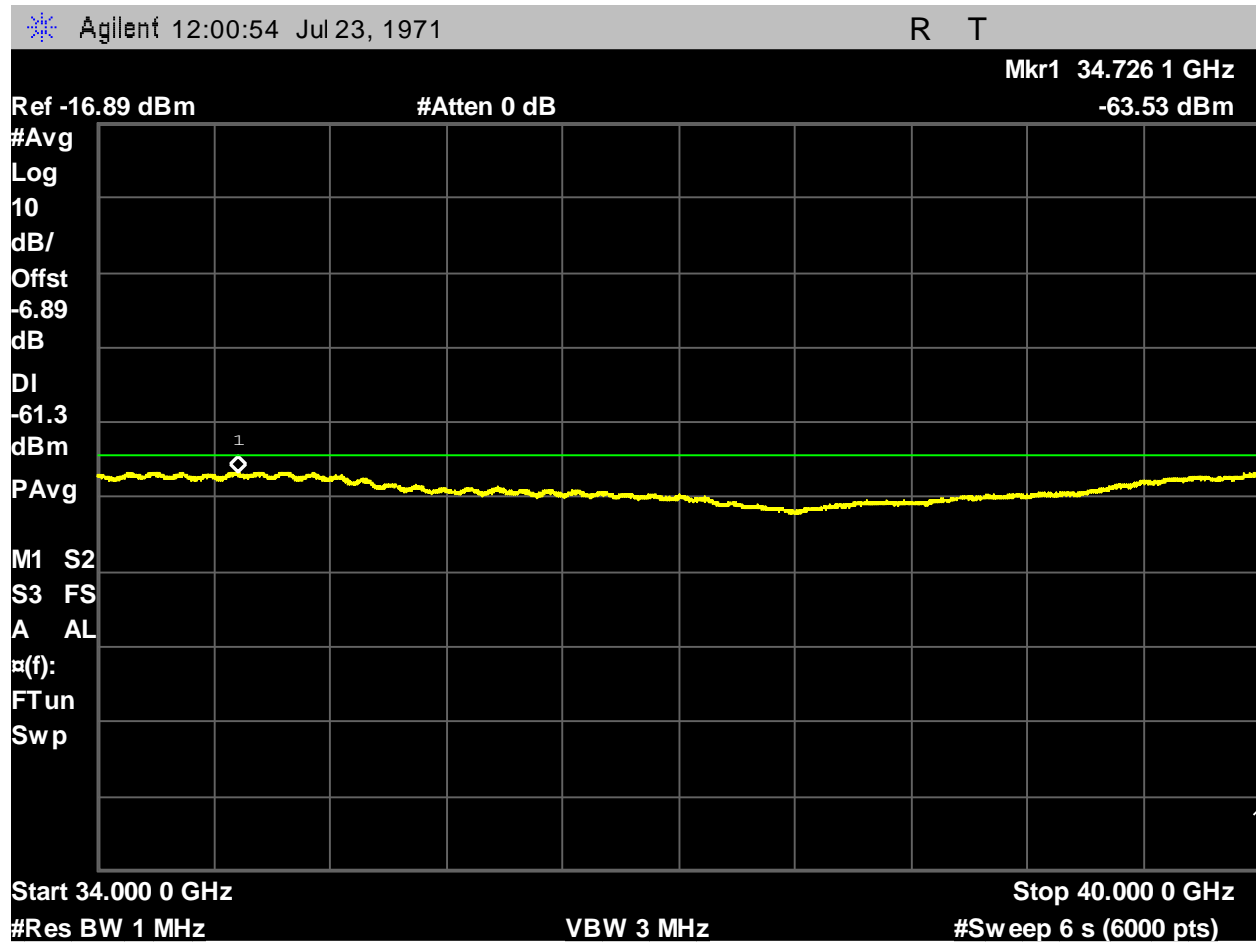


Figure 26. UWT-7010_Radiated Spurious Emissions_1mbp_34-40 GHz_H

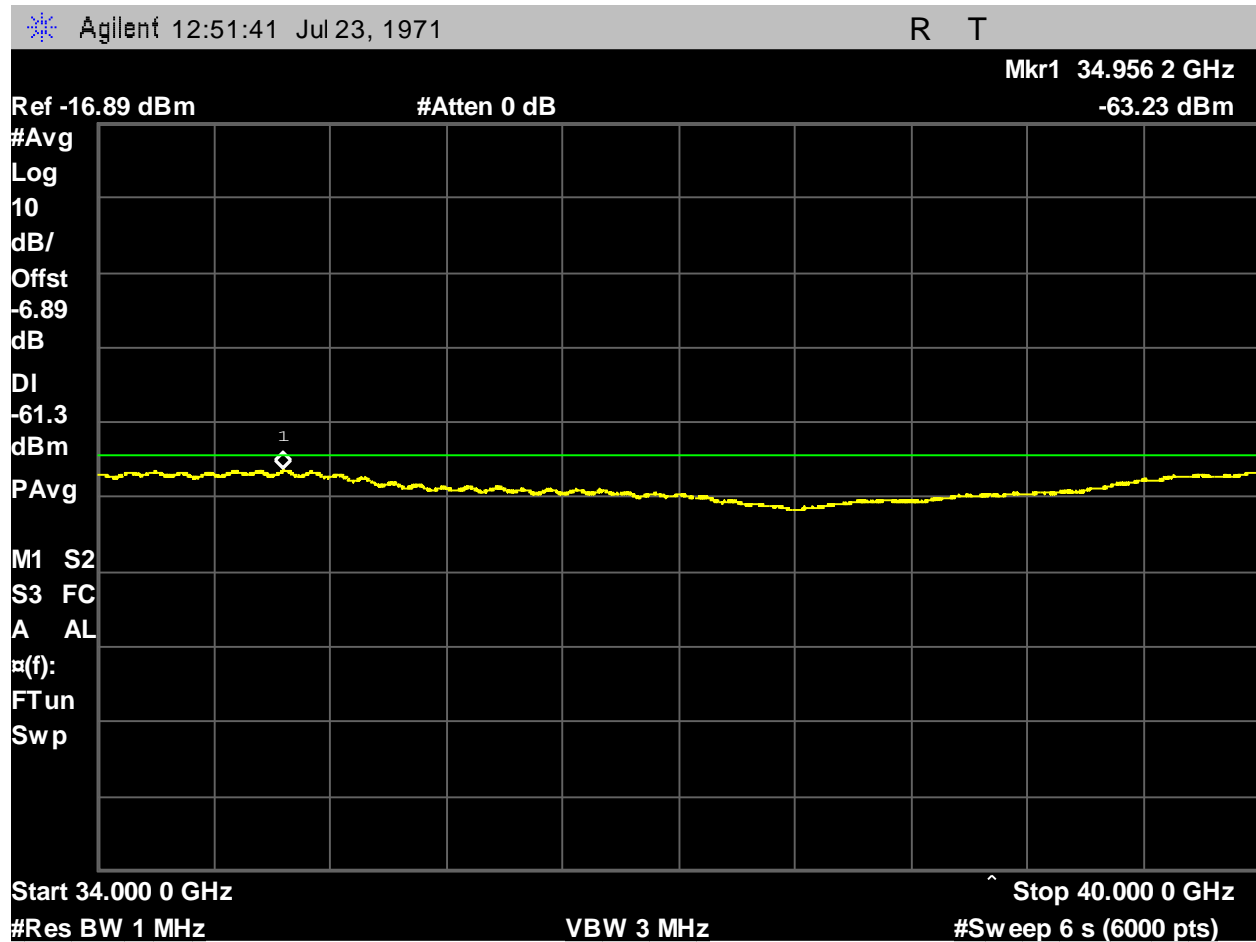


Figure 27. UWT-7010_Radiated Spurious Emissions_1mbp_34-40 GHz_V

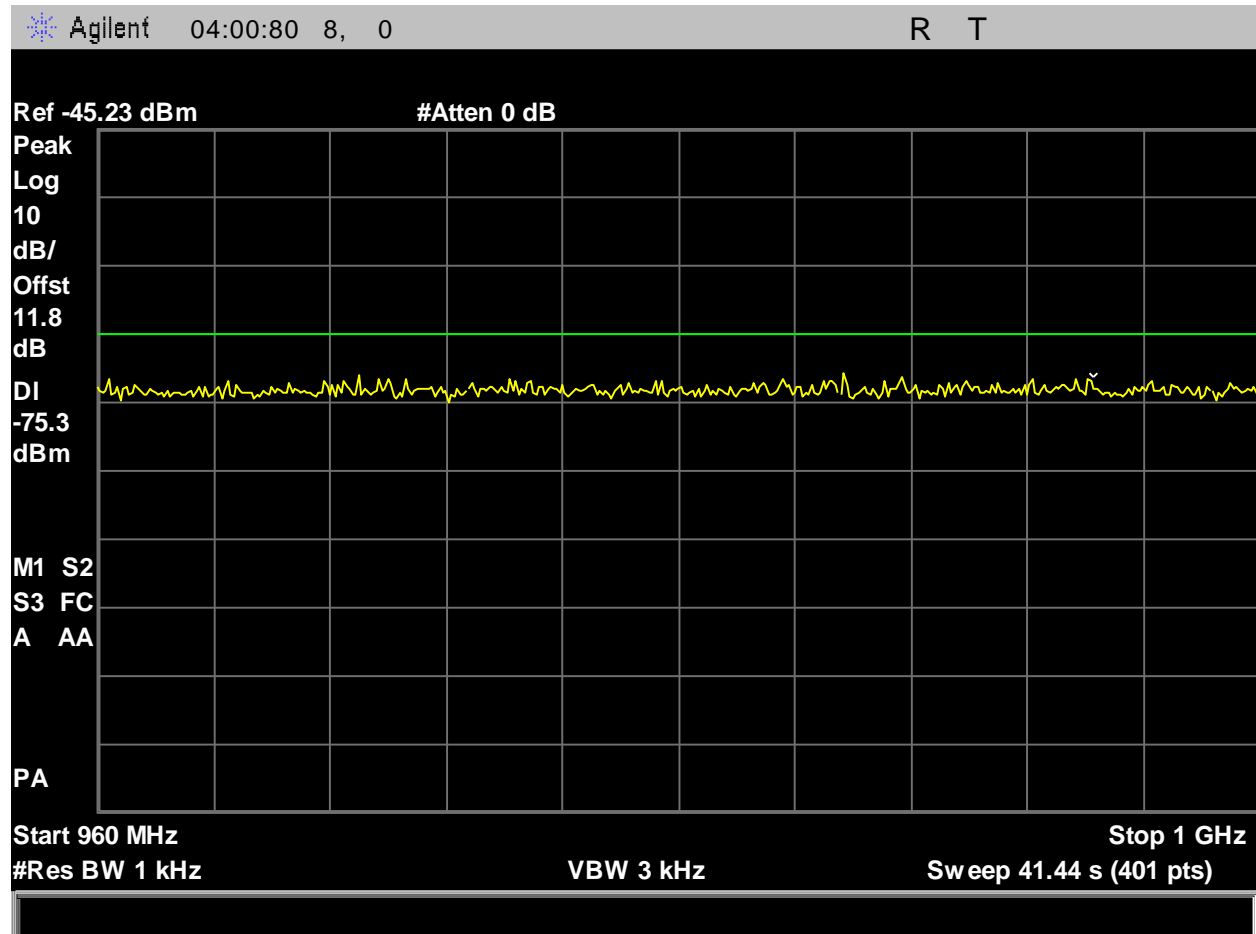


Figure 28. UWT-7010_Radiated Spurious Emissions_1mbp_960-1000 MHz_H

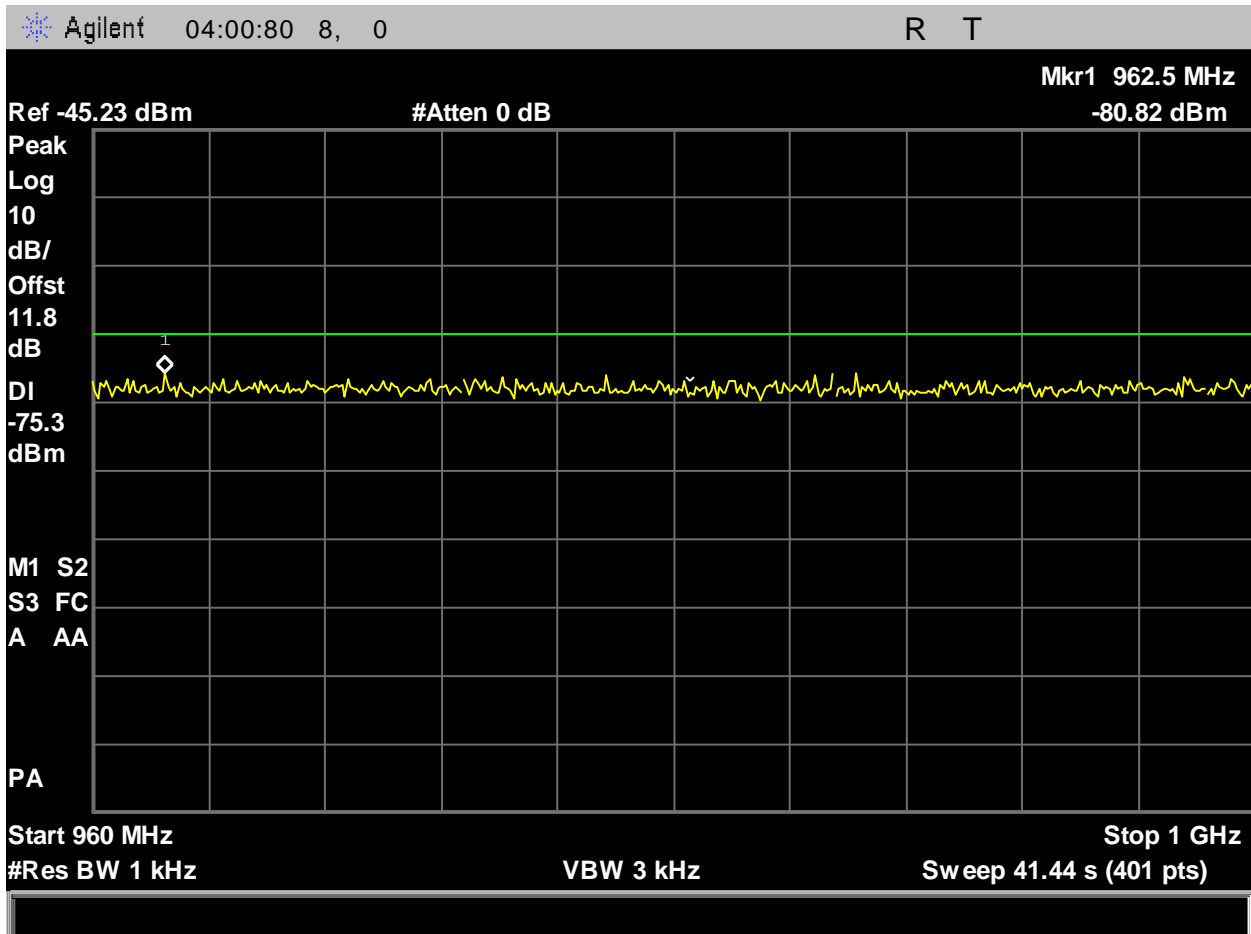


Figure 29. UWT-7010_Radiated Spurious Emissions_1mbp_960-1000 MHz_V

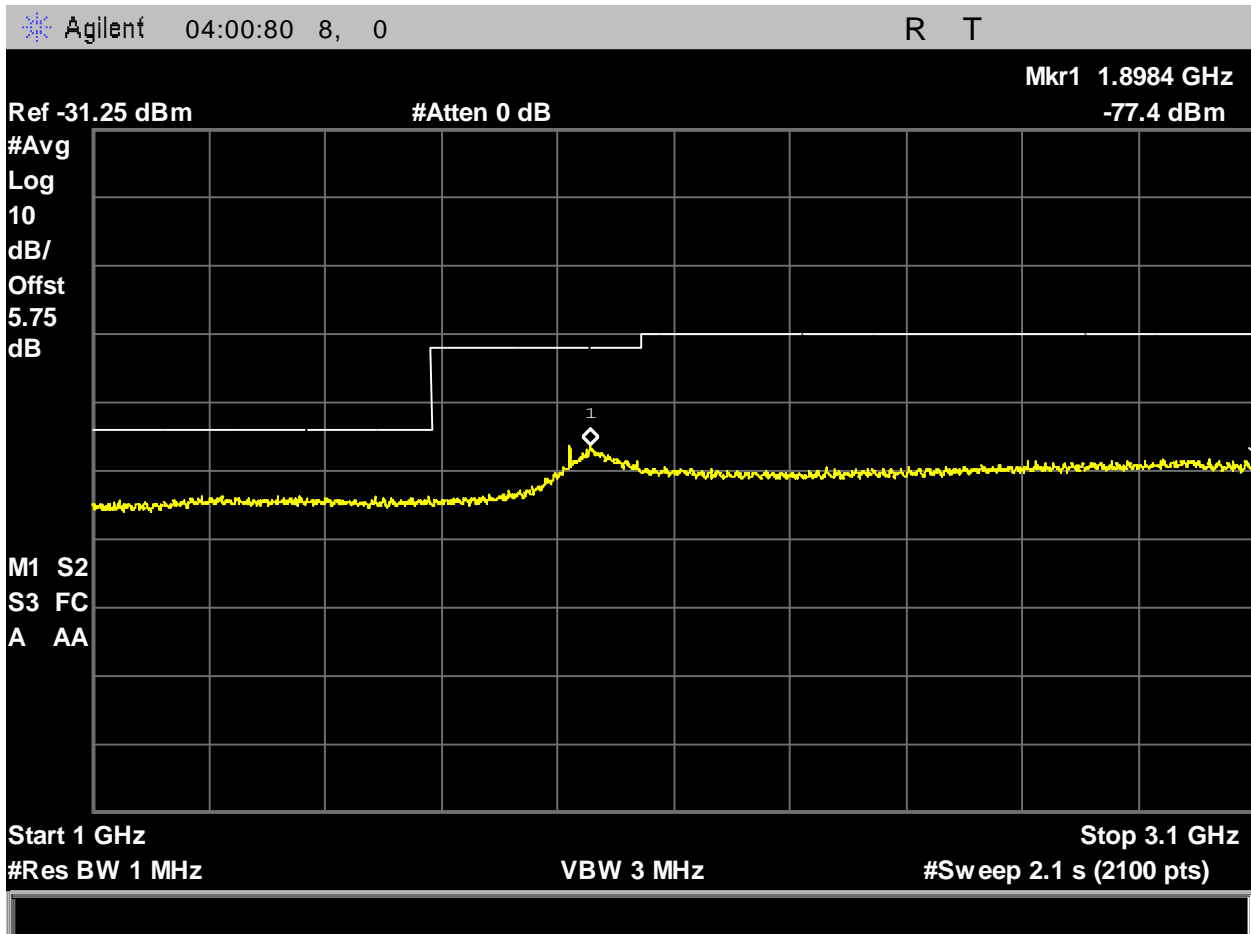


Figure 30. UWT-7010_Radiated Spurious Emissions_2mbp_1000-3100 MHz_H

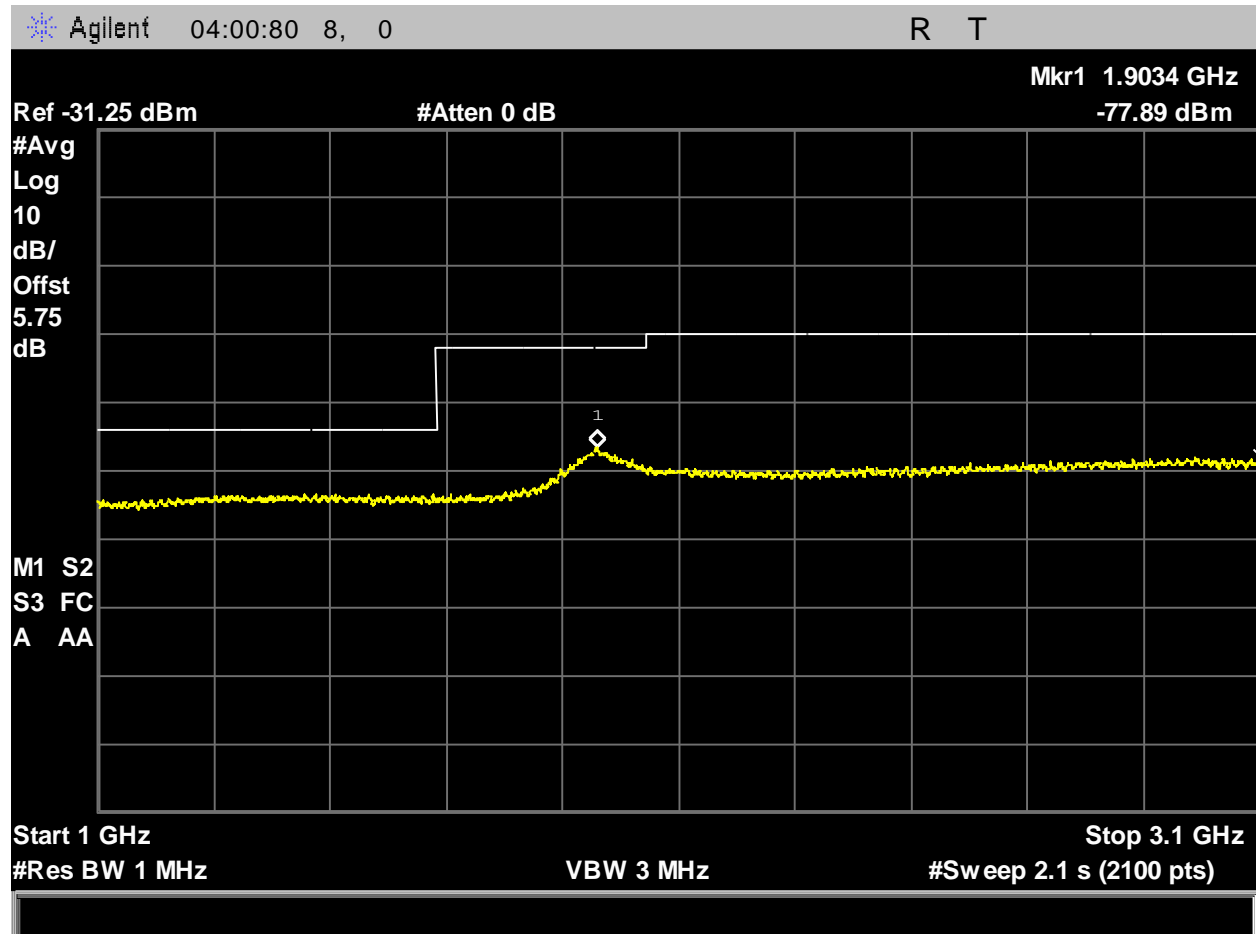


Figure 31. UWT-7010_Radiated Spurious Emissions_2mbp_1000-3100 MHz_V

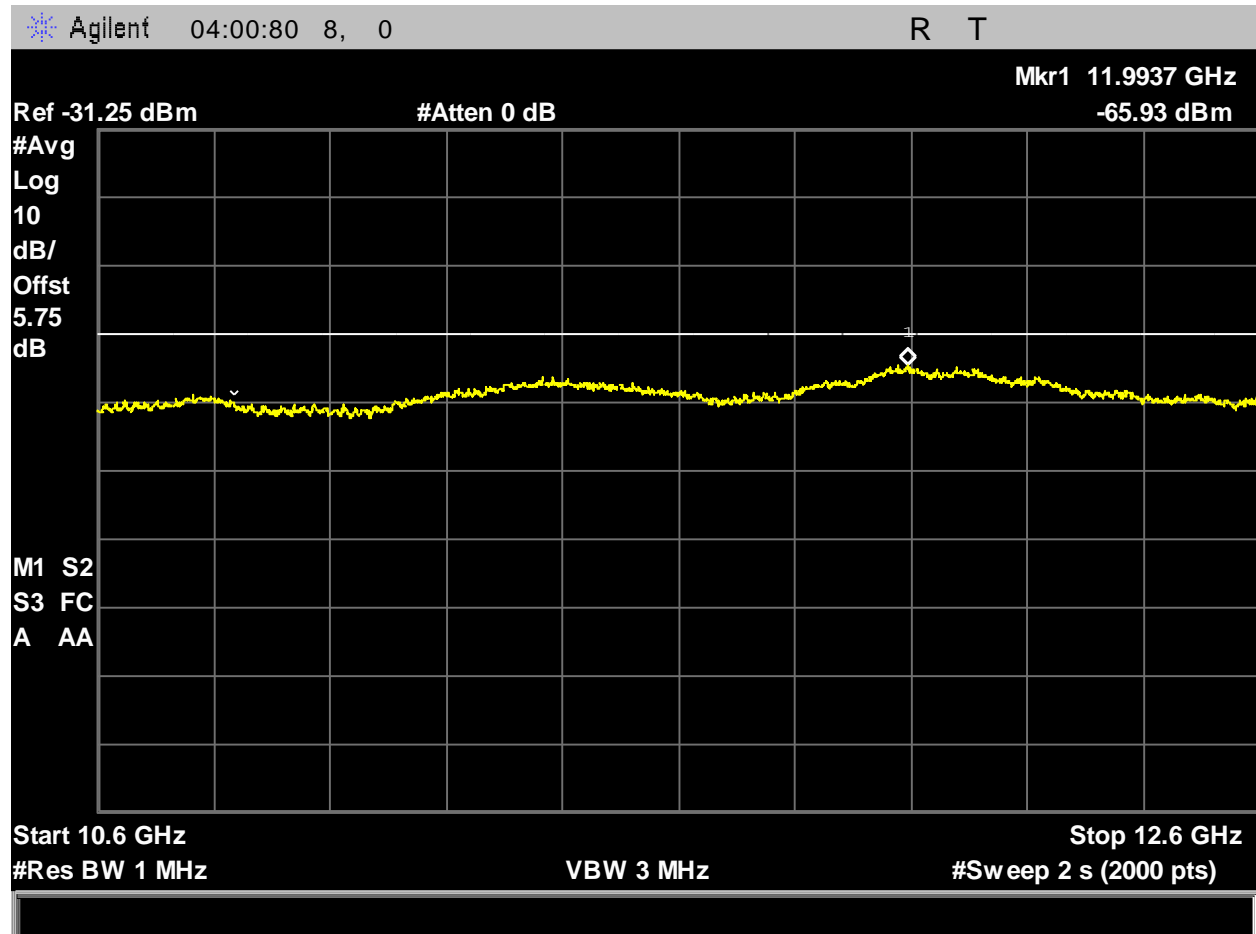


Figure 32. UWT-7010_Radiated Spurious Emissions_2mbp_10600-12600 MHz_H

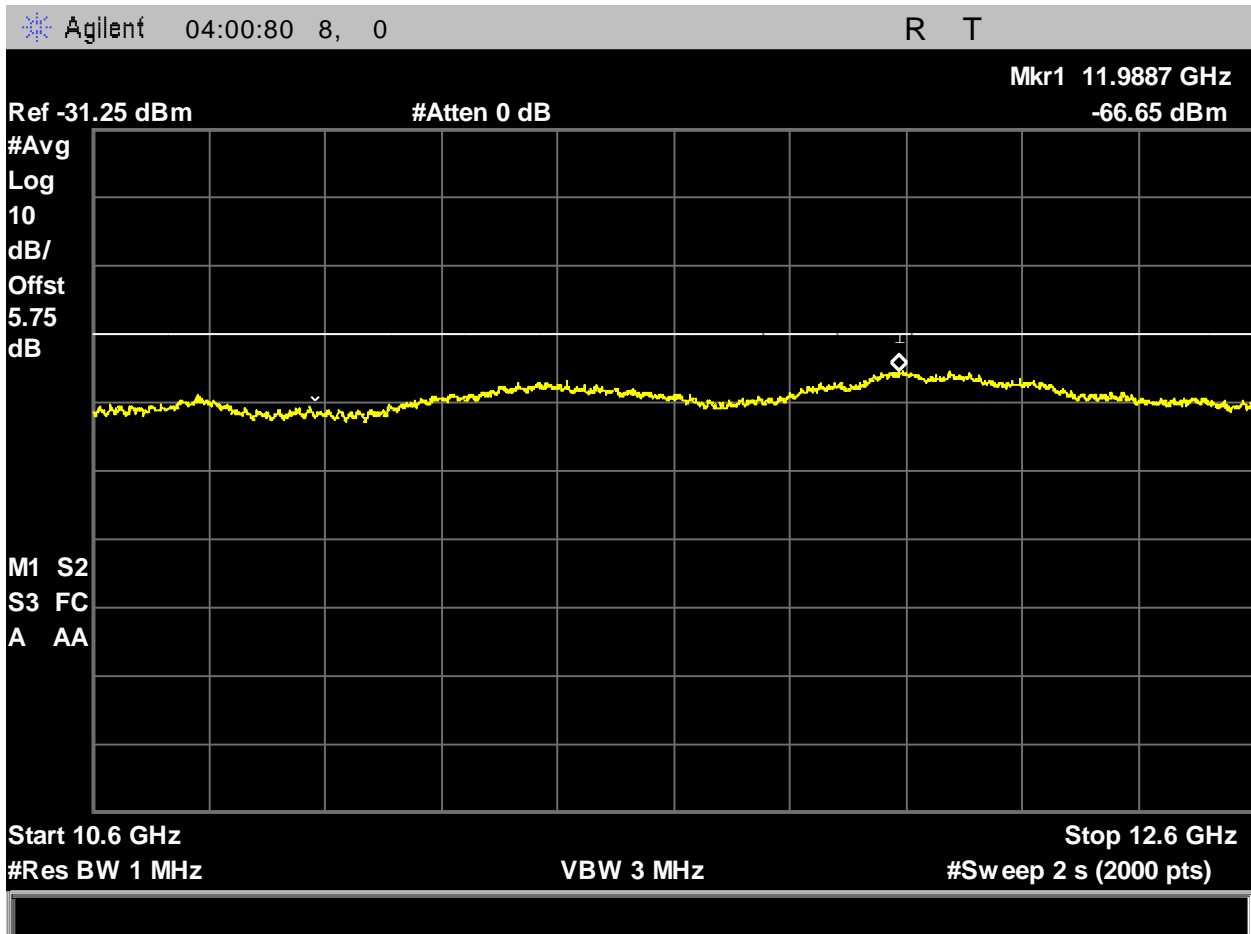


Figure 33. UWT-7010_Radiated Spurious Emissions_2mbp_10600-12600 MHz_V

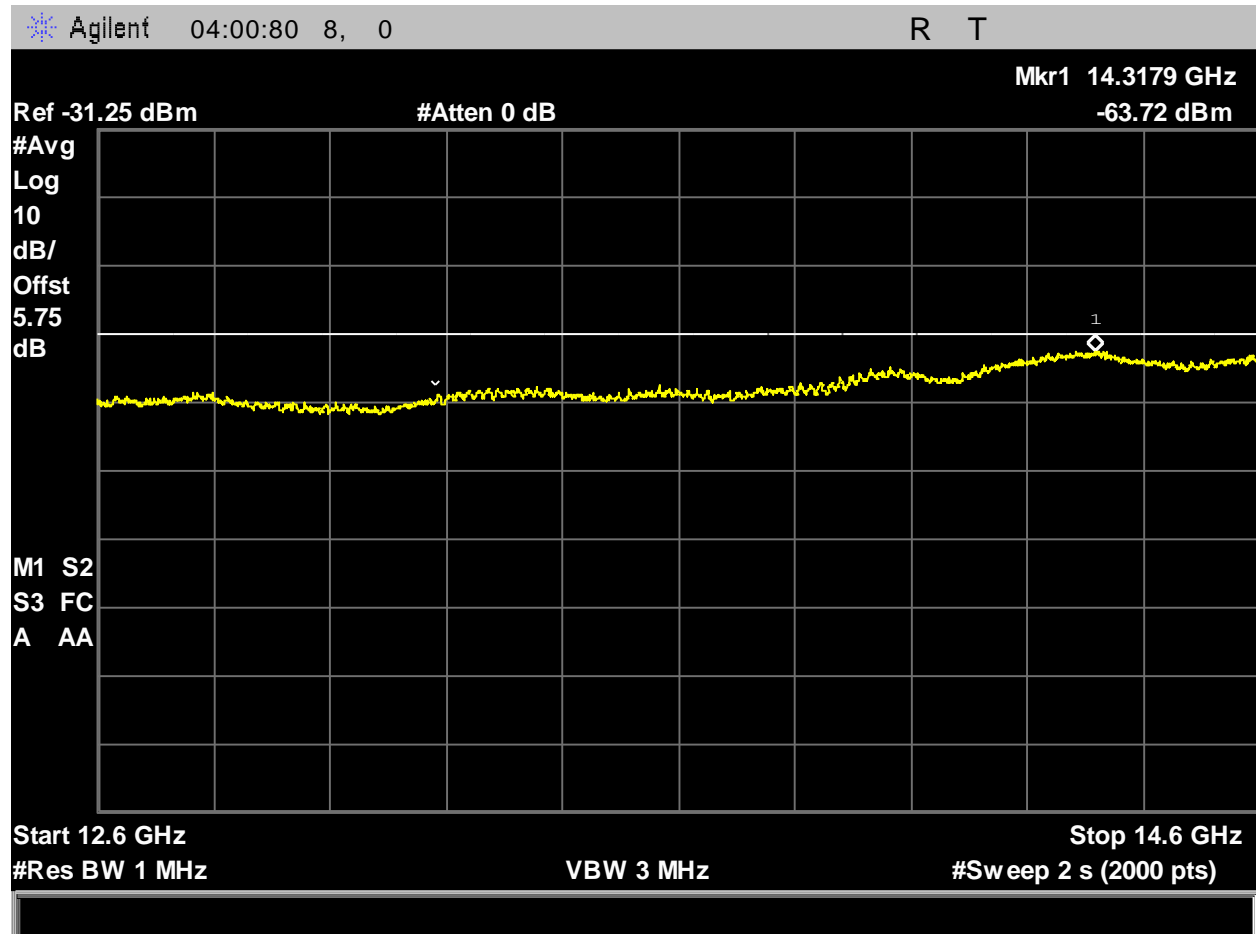


Figure 34. UWT-7010_Radiated Spurious Emissions_2mbp_12600-14600 MHz_H

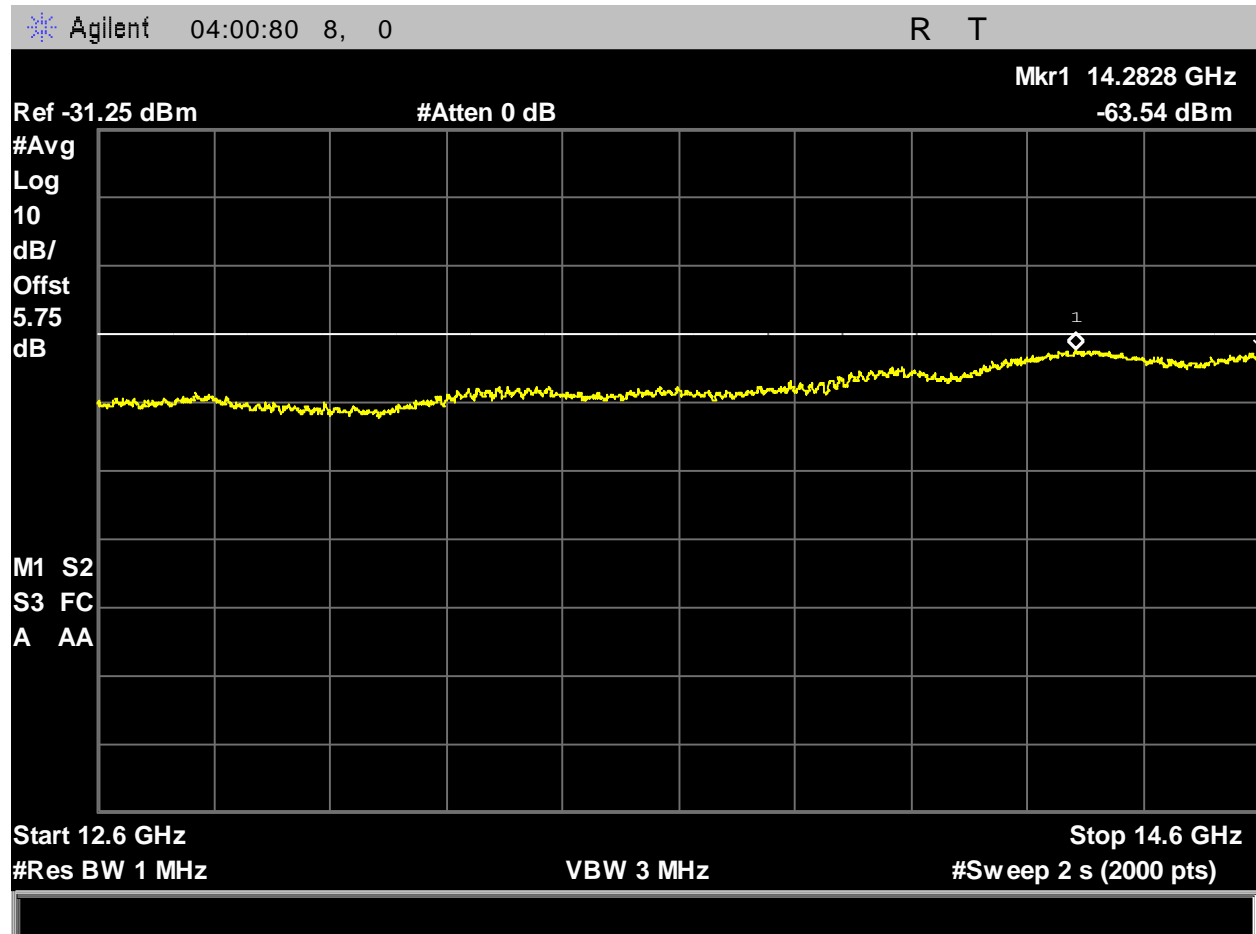


Figure 35. UWT-7010_Radiated Spurious Emissions_2mbp_12600-14600 MHz_V

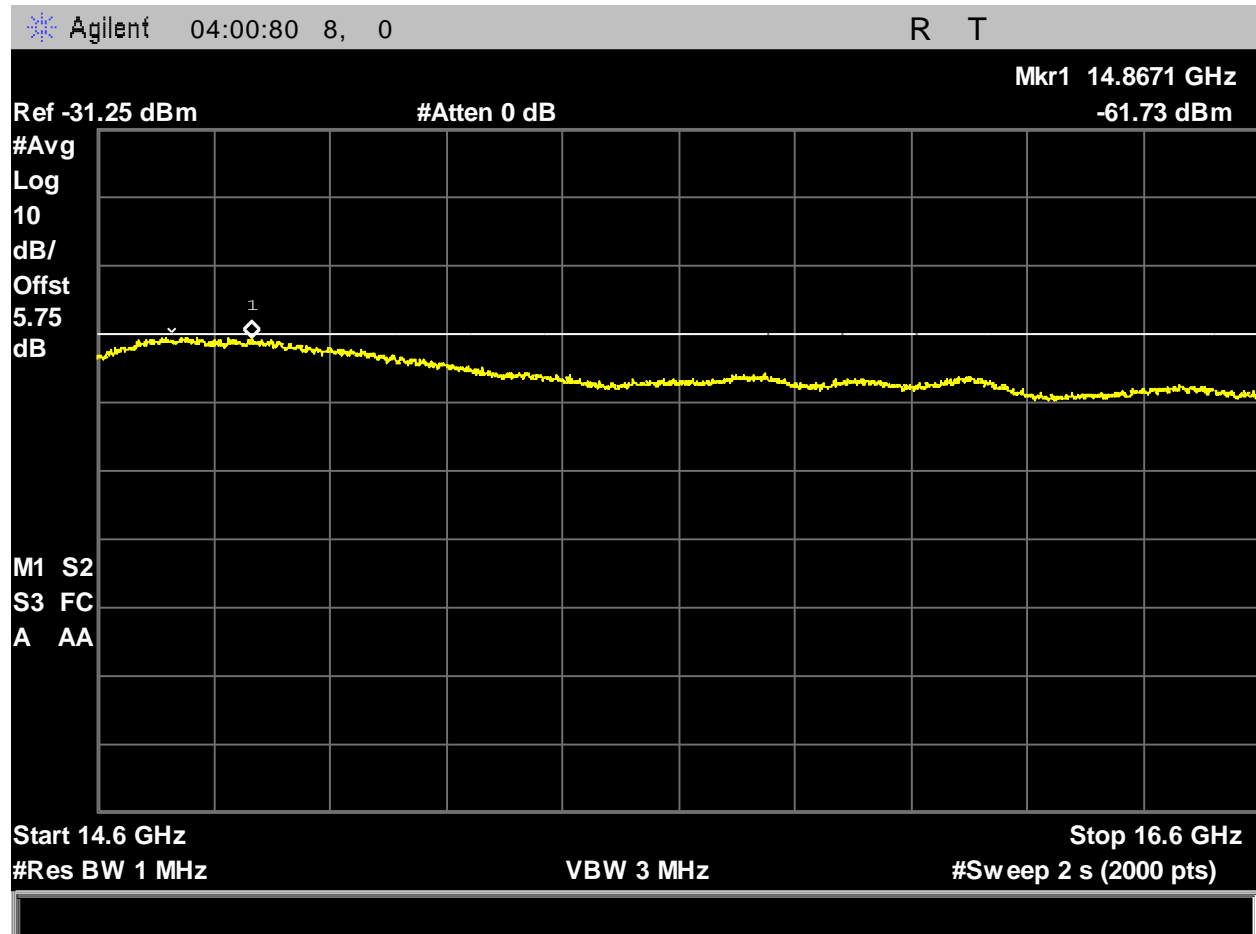


Figure 36. UWT-7010_Radiated Spurious Emissions_2mbp_14600-16600 MHz_H

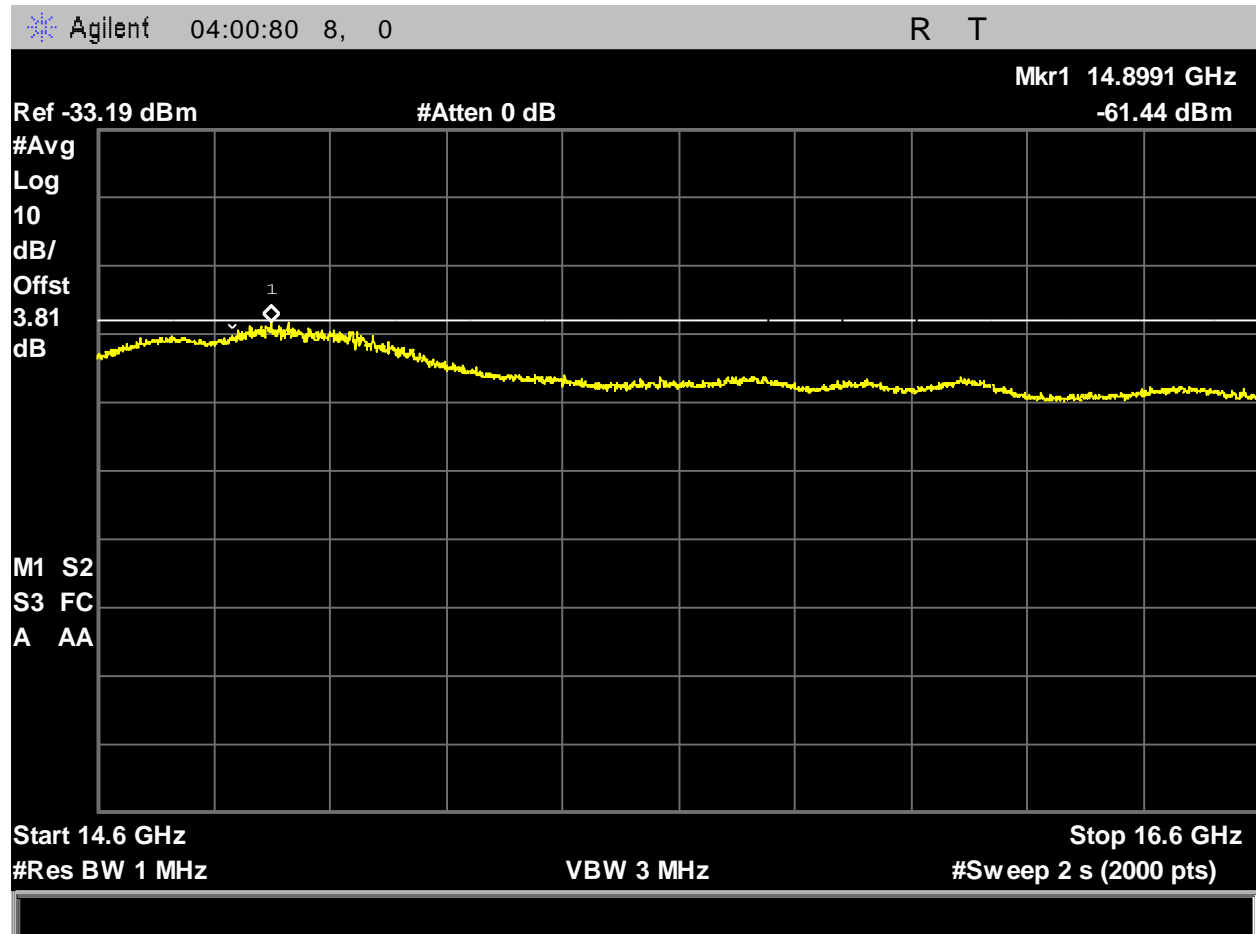


Figure 37. UWT-7010_Radiated Spurious Emissions_2mbp_14600-16600 MHz_V

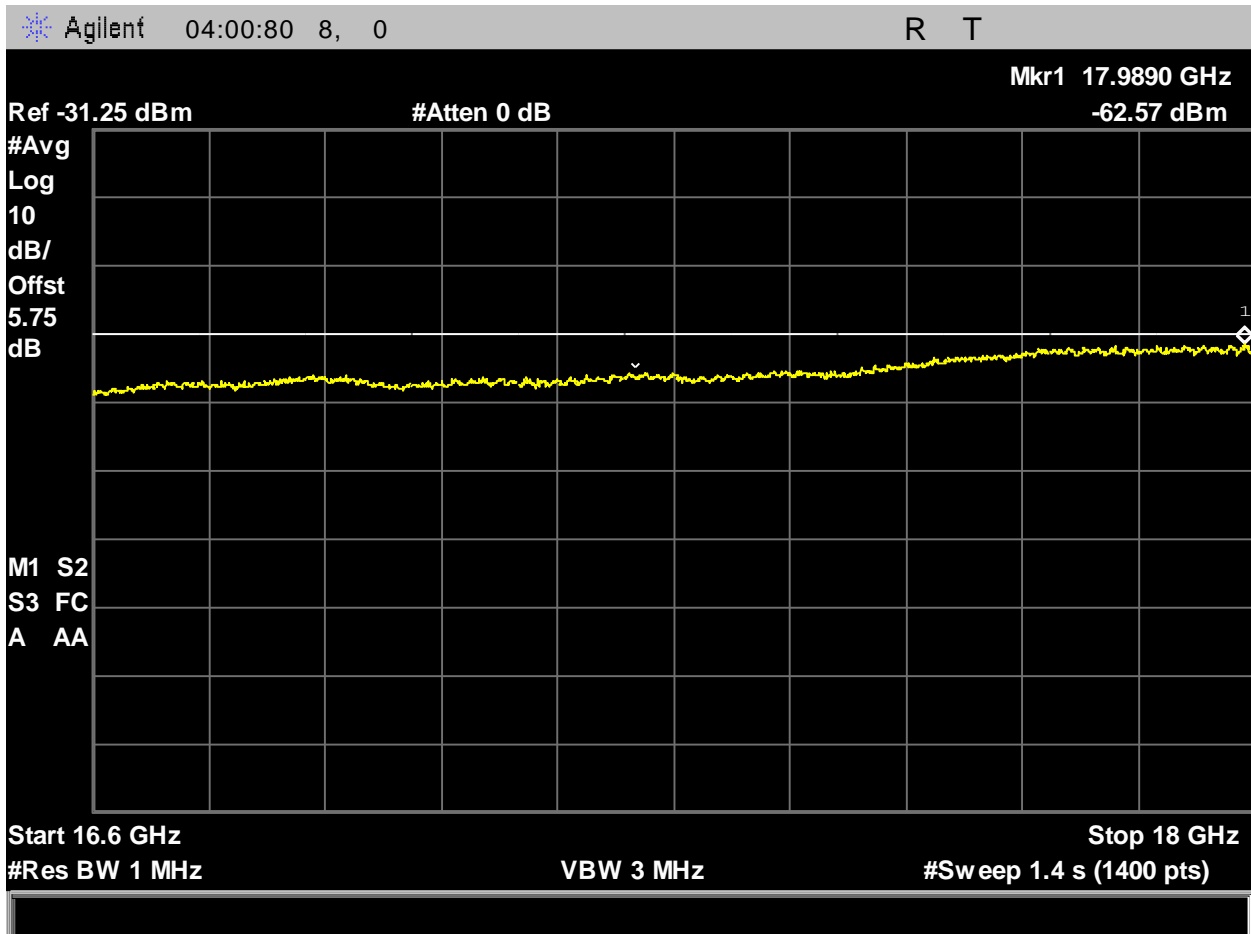


Figure 38. UWT-7010_Radiated Spurious Emissions_2mbp_16600-18000 MHz_H

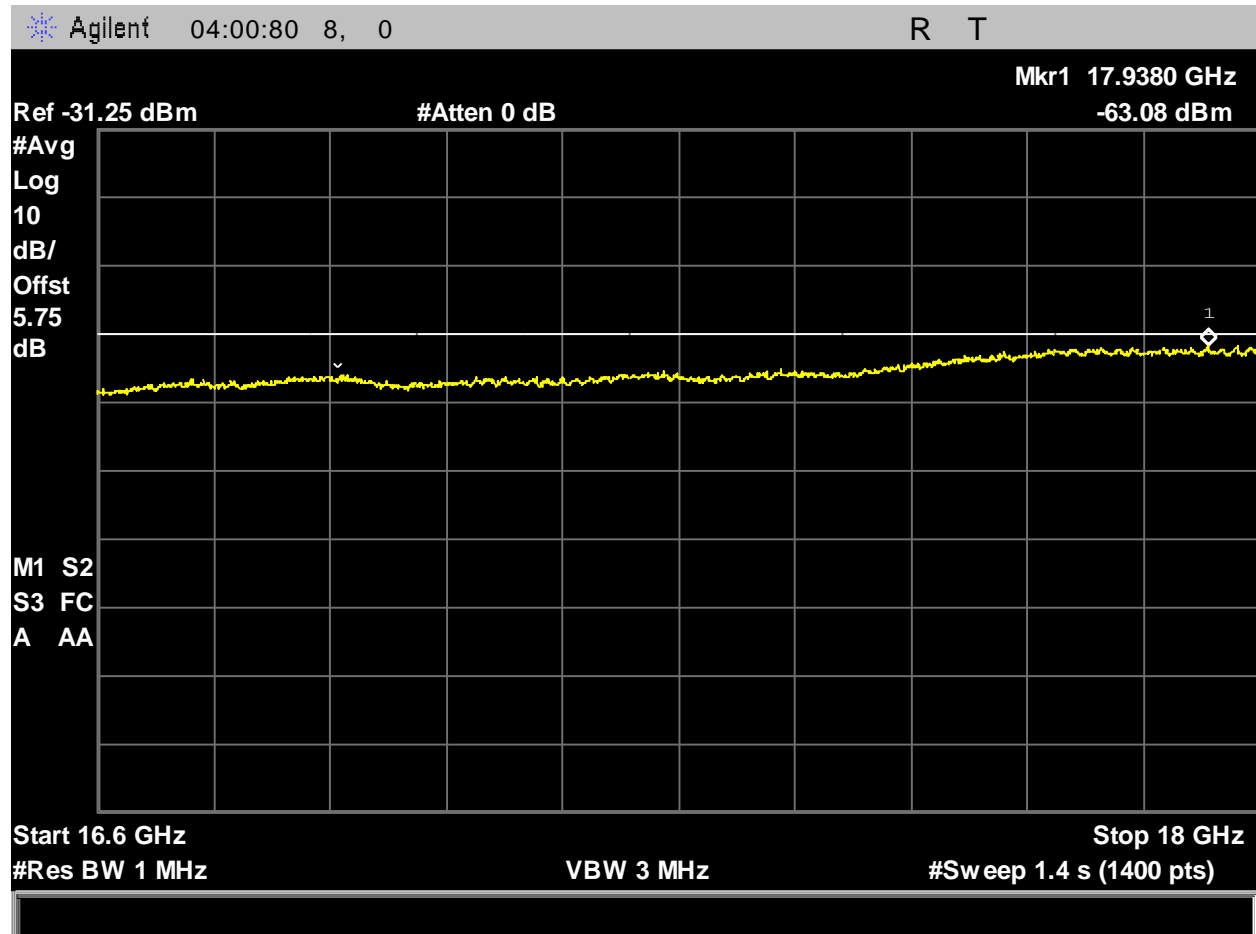


Figure 39. UWT-7010_Radiated Spurious Emissions_2mbp_16600-18000 MHz_V

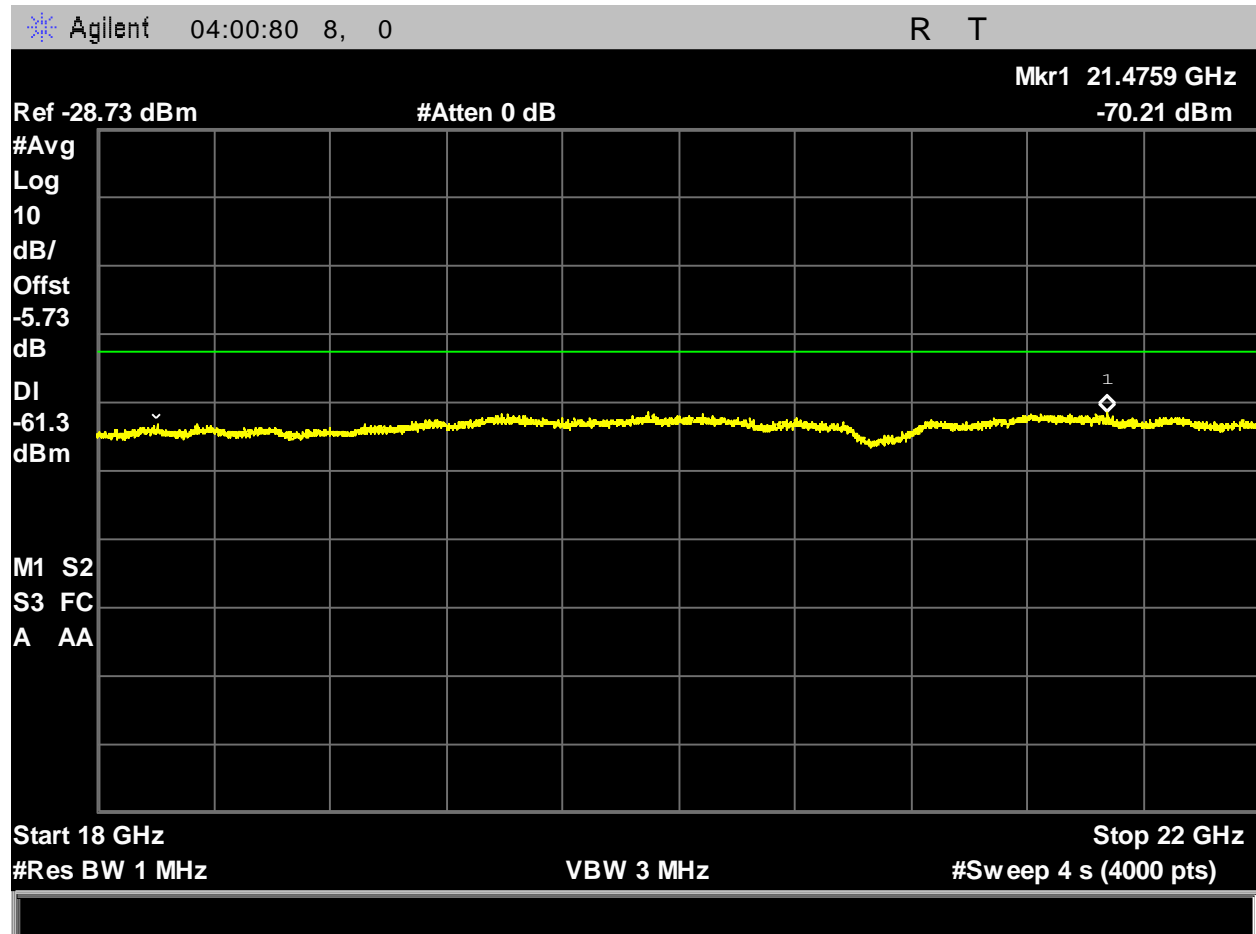


Figure 40. UWT-7010_Radiated Spurious Emissions_2mbp_18-22 GHz_H

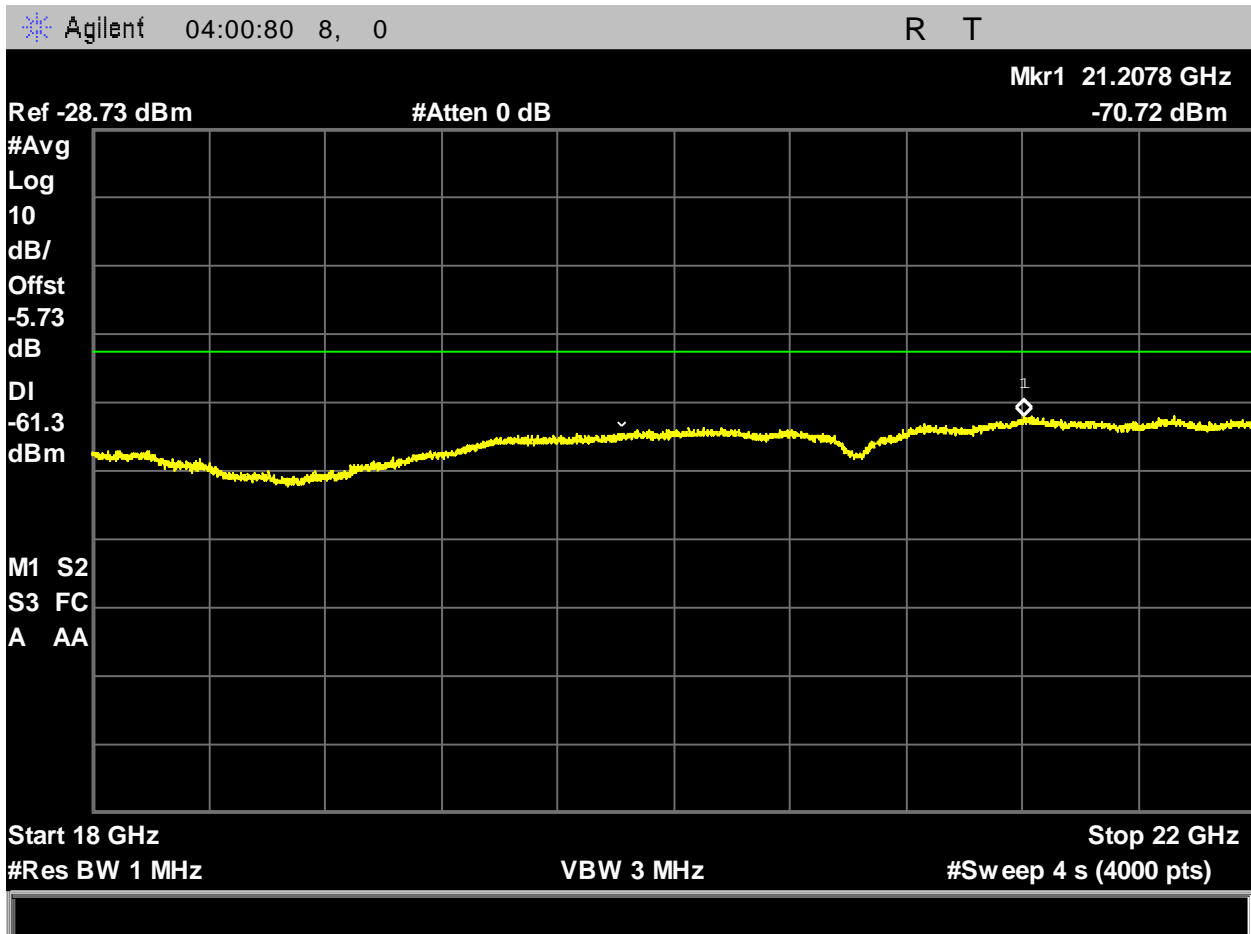


Figure 41. UWT-7010_Radiated Spurious Emissions_2mbp_18-22 GHz_V

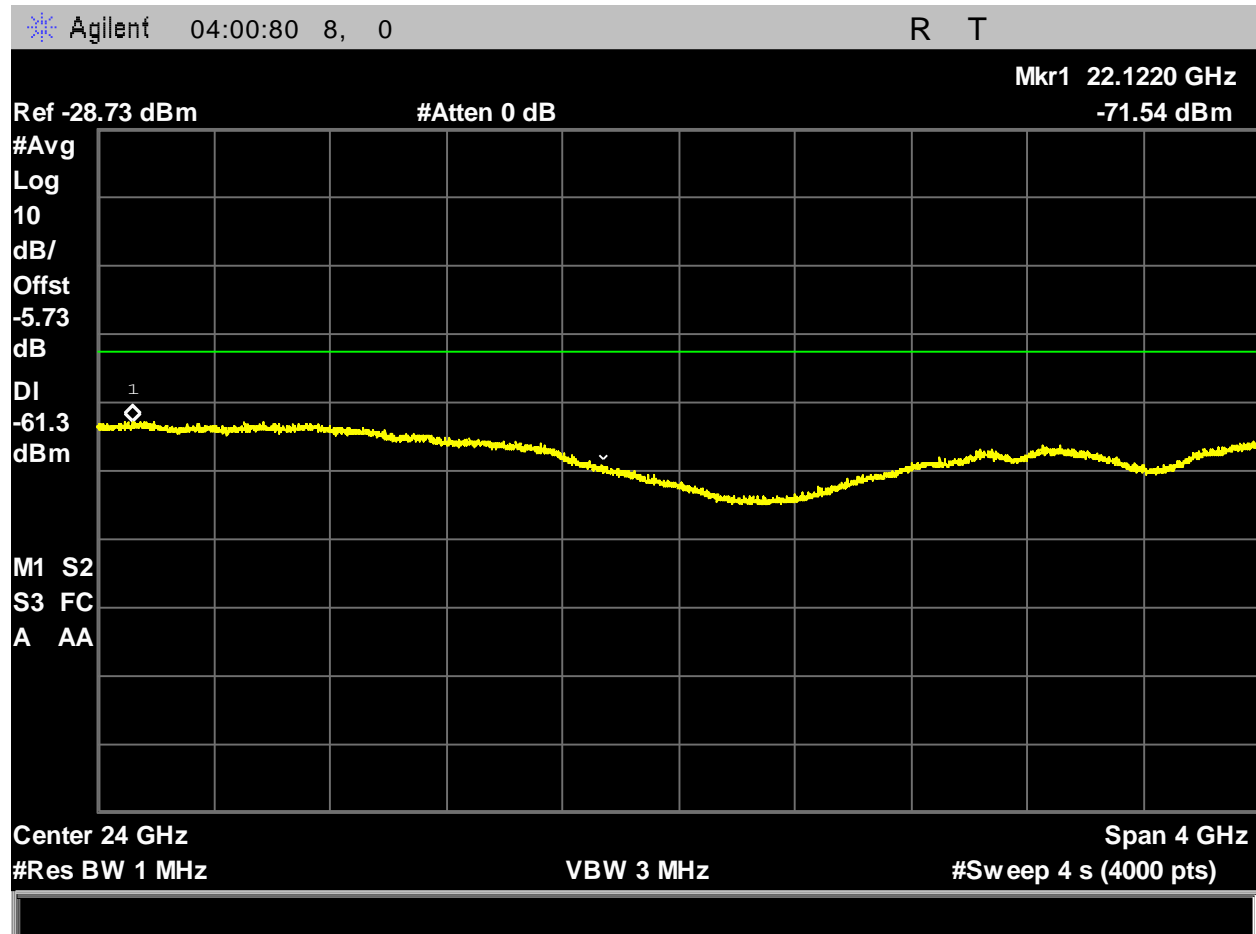


Figure 42. UWT-7010_Radiated Spurious Emissions_2mbp_22-26 GHz_H

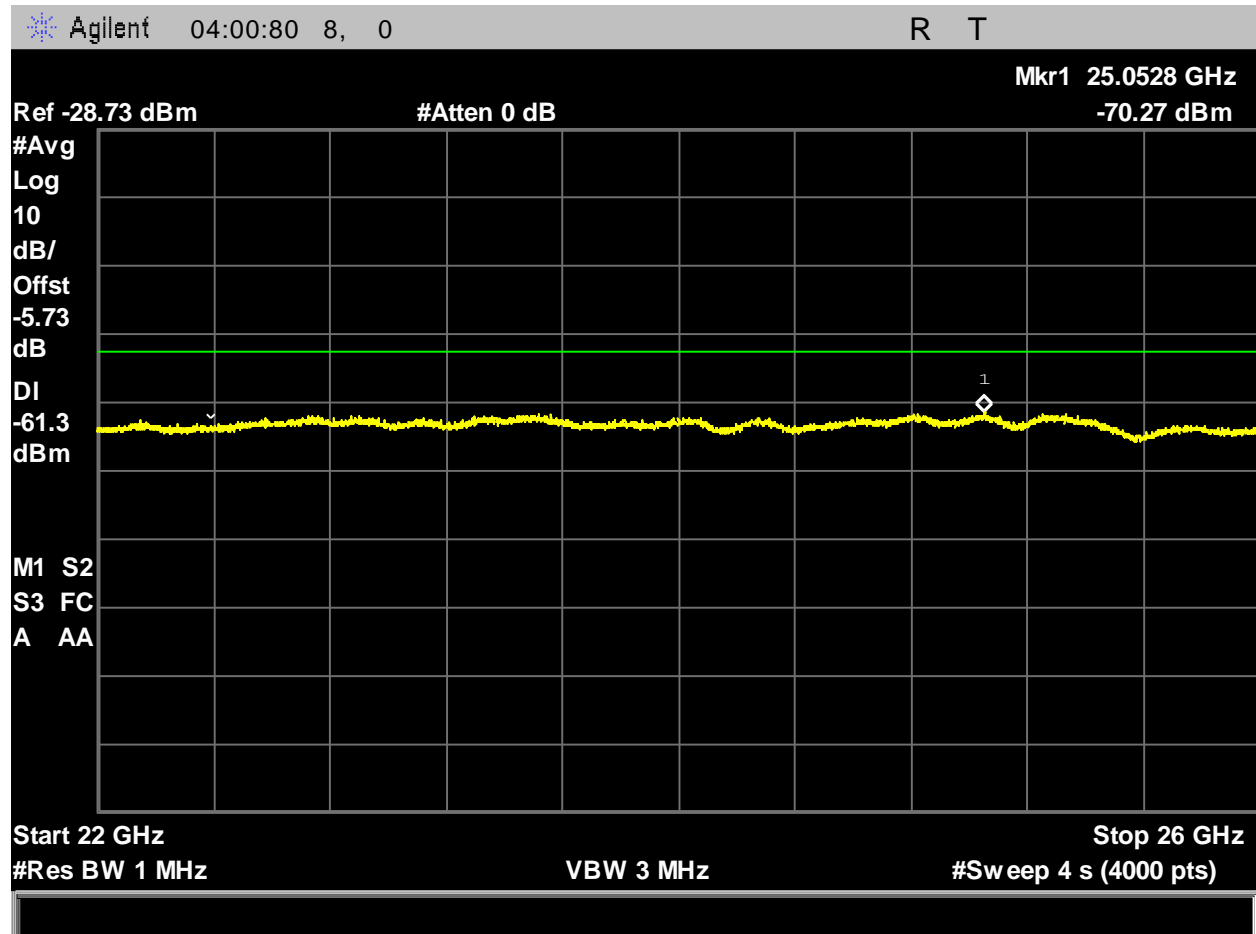


Figure 43. UWT-7010_Radiated Spurious Emissions_2mbp_22-26 GHz_V

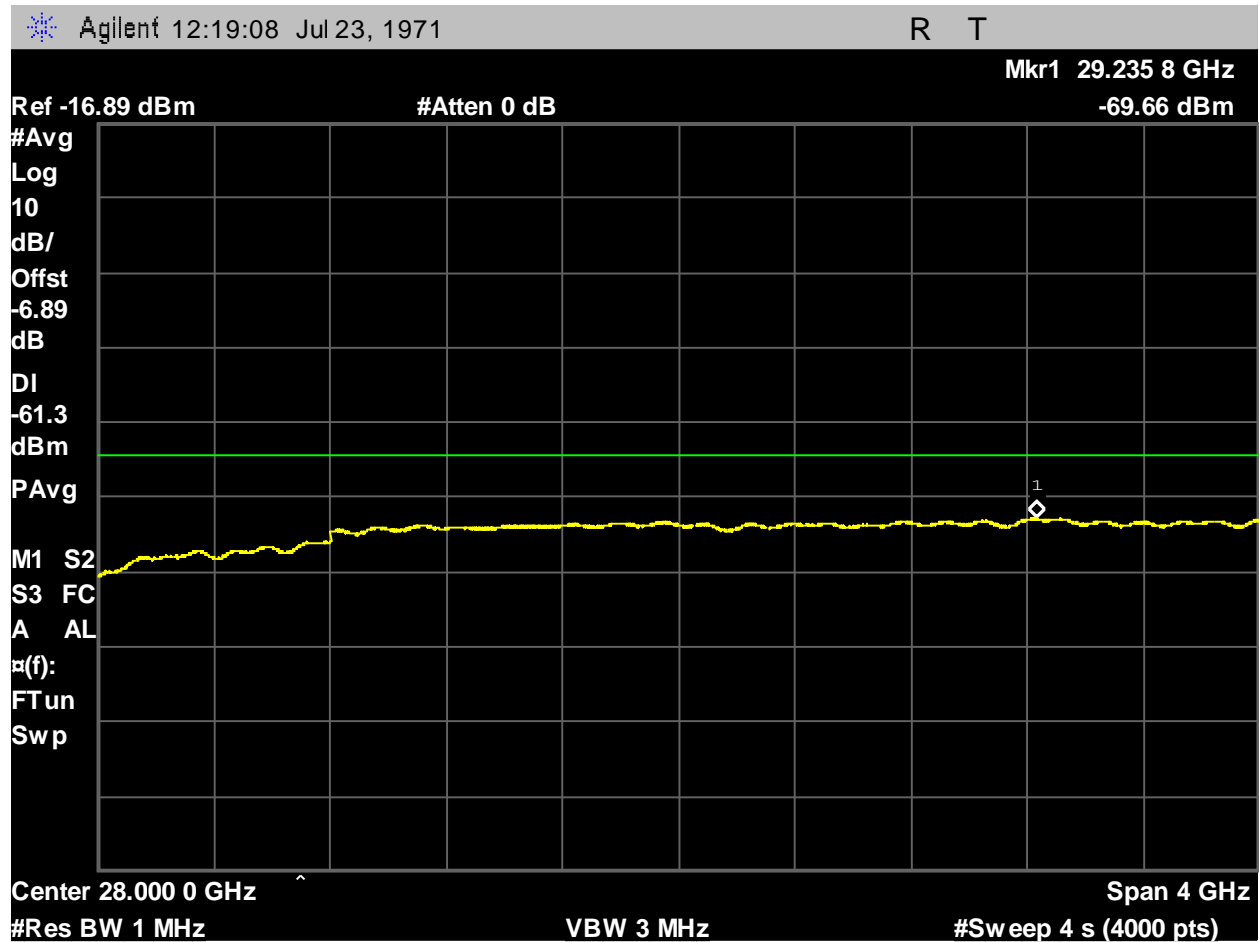


Figure 44. UWT-7010_Radiated Spurious Emissions_2mbp_26-30 GHz_H

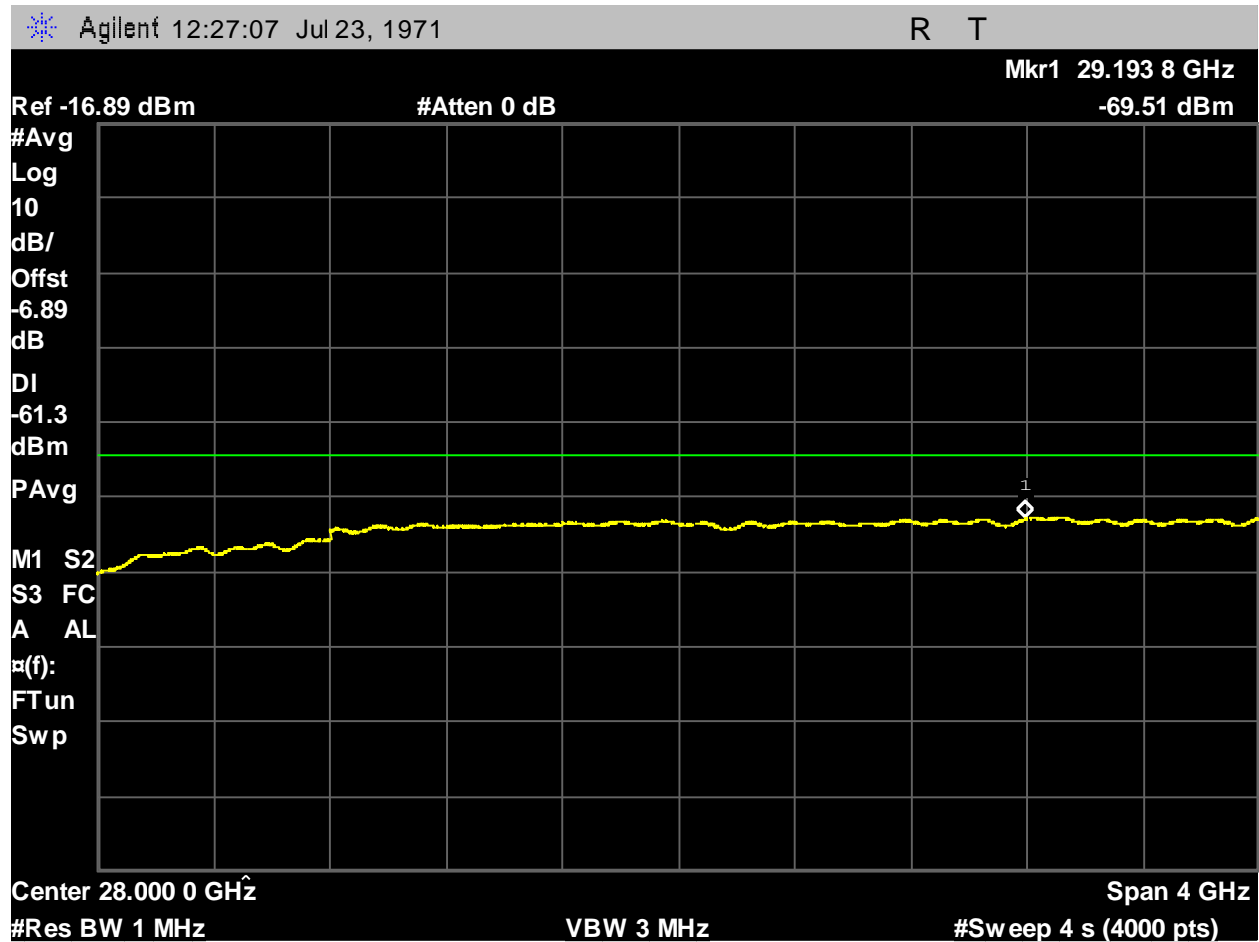


Figure 45. UWT-7010_Radiated Spurious Emissions_2mbp_26-30 GHz_V

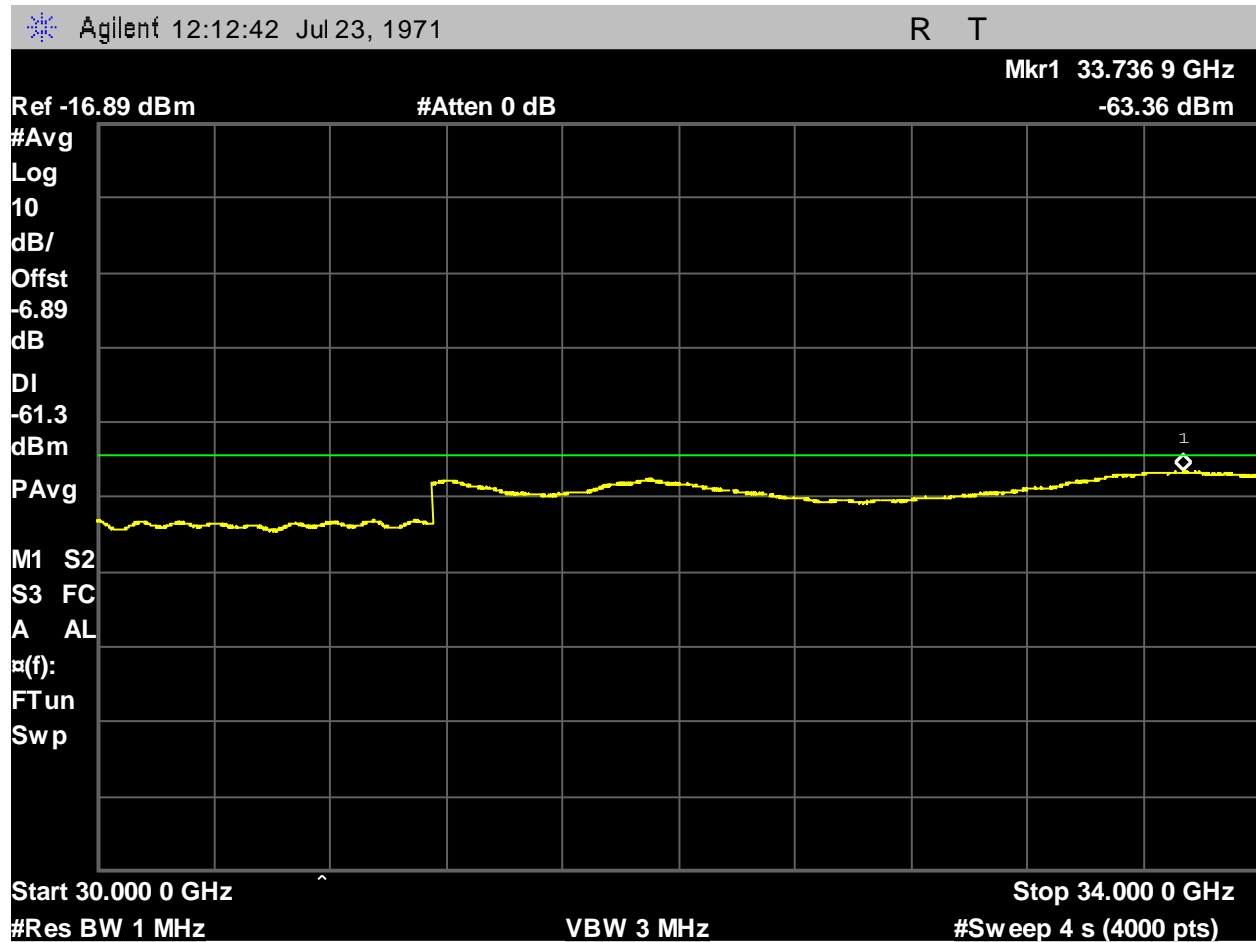


Figure 46. UWT-7010_Radiated Spurious Emissions_2mbp_30-34 GHz_H

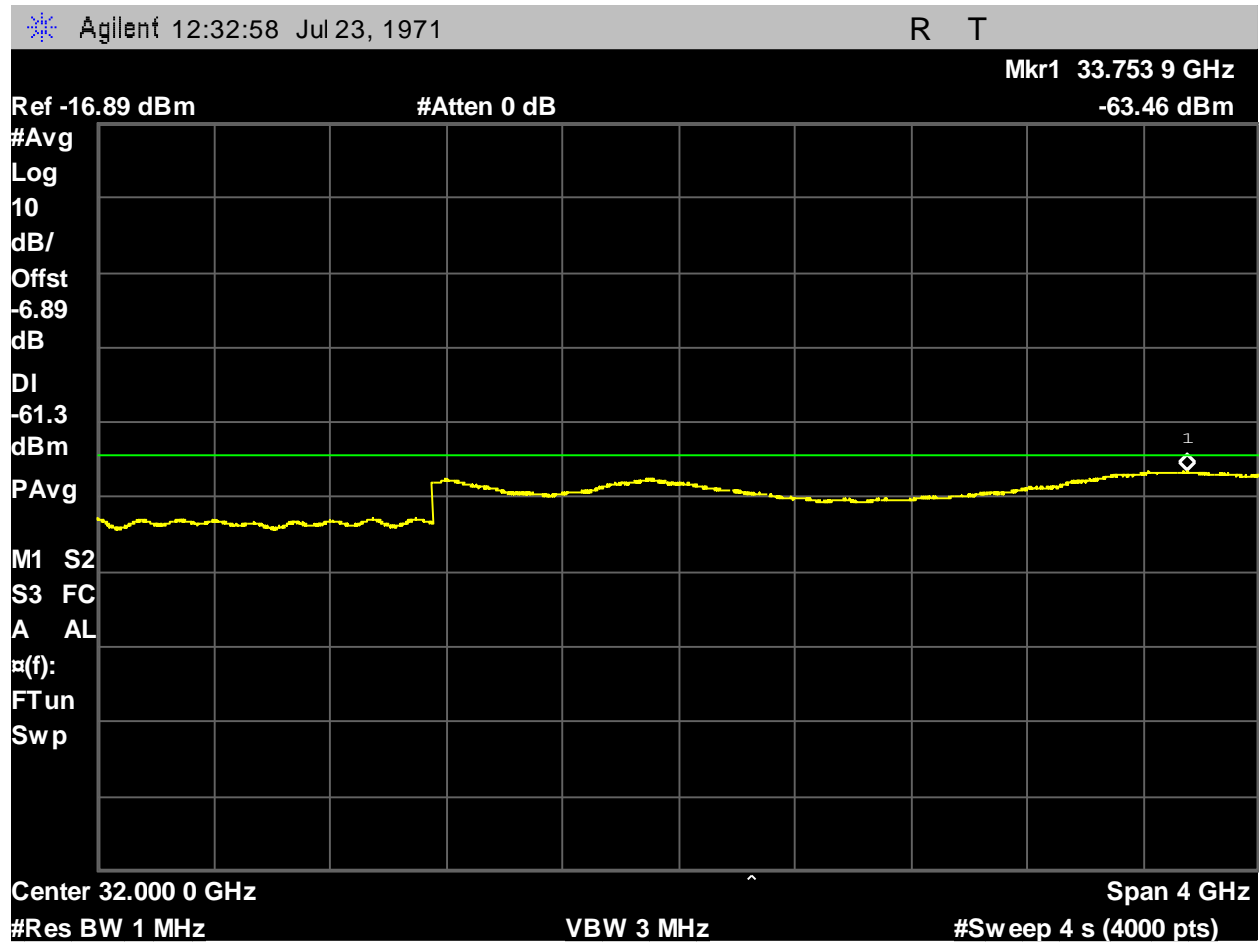


Figure 47. UWT-7010_Radiated Spurious Emissions_2mbp_30-34 GHz_V

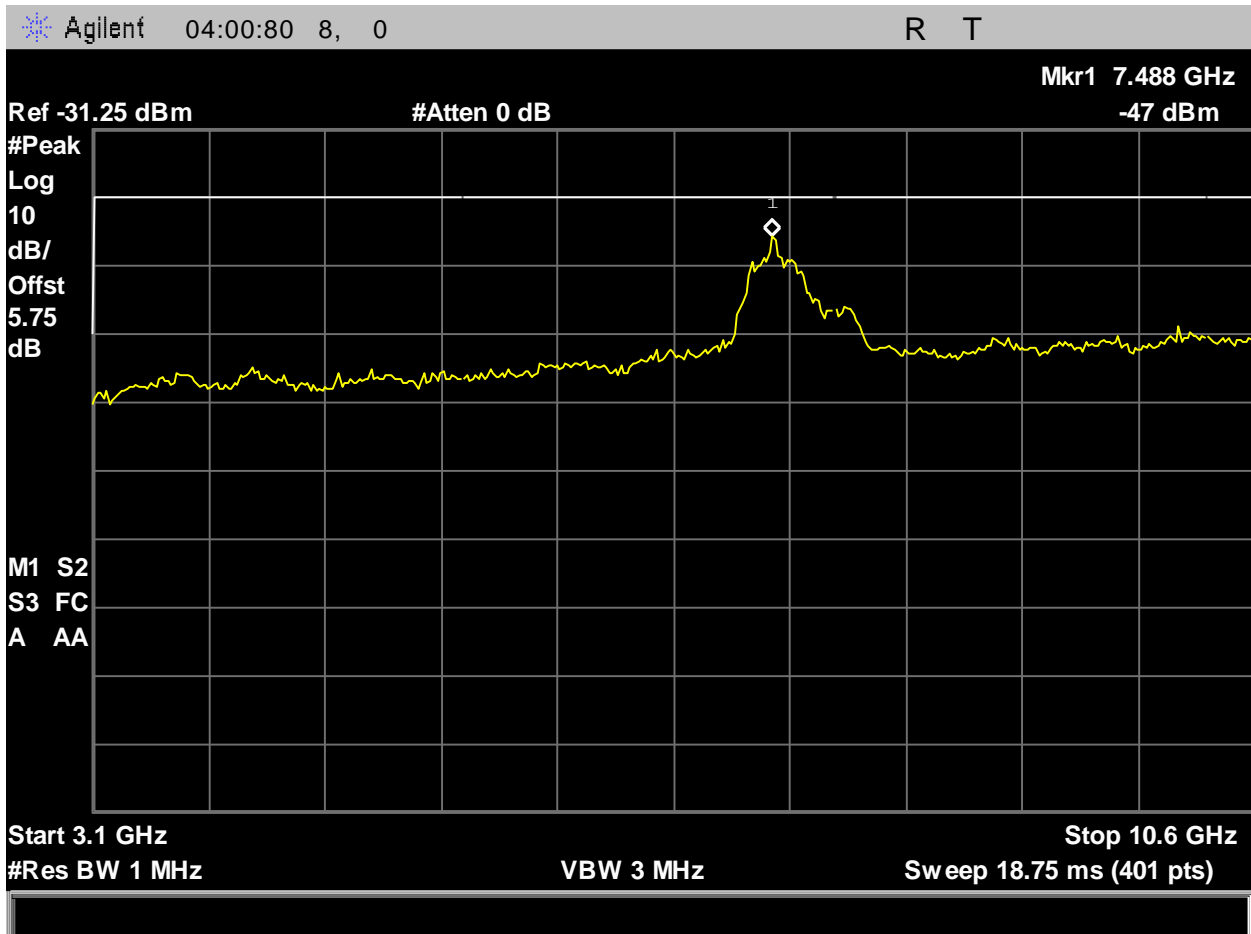


Figure 48. UWT-7010_Radiated Spurious Emissions_2mbp_3100-10600 MHz_H

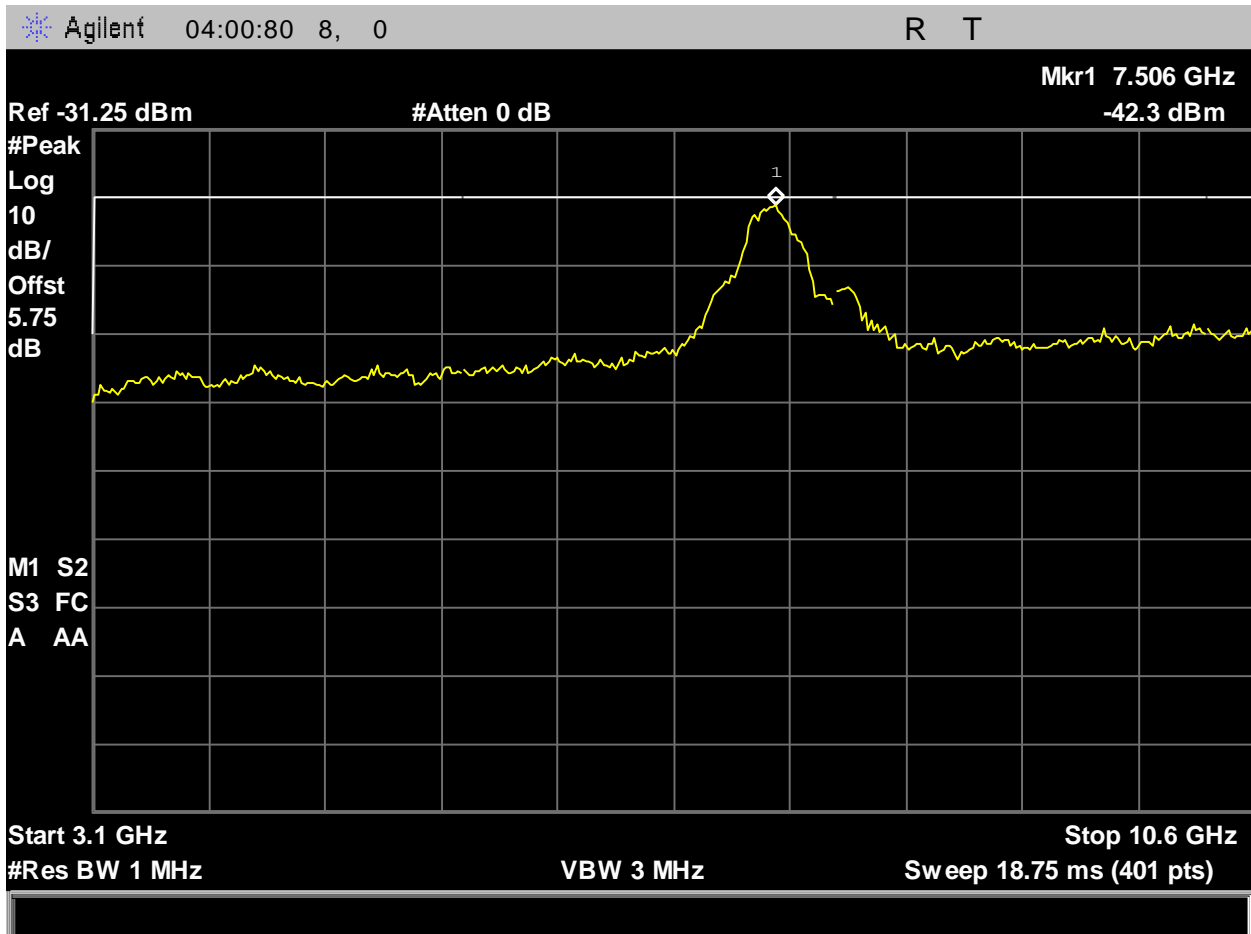


Figure 49. UWT-7010_Radiated Spurious Emissions_2mbp_3100-10600 MHz_V

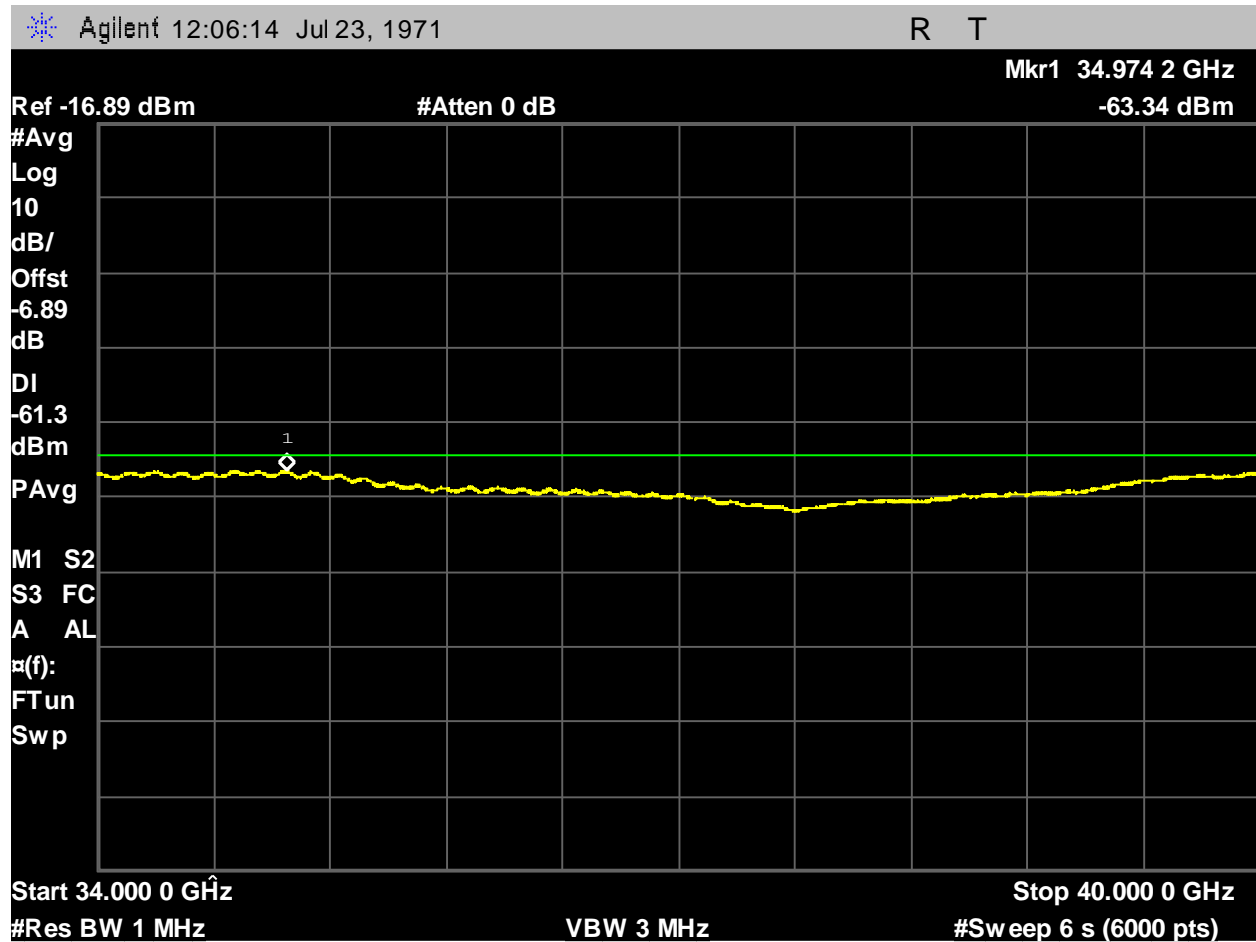


Figure 50. UWT-7010_Radiated Spurious Emissions_2mbp_34-40 GHz_H

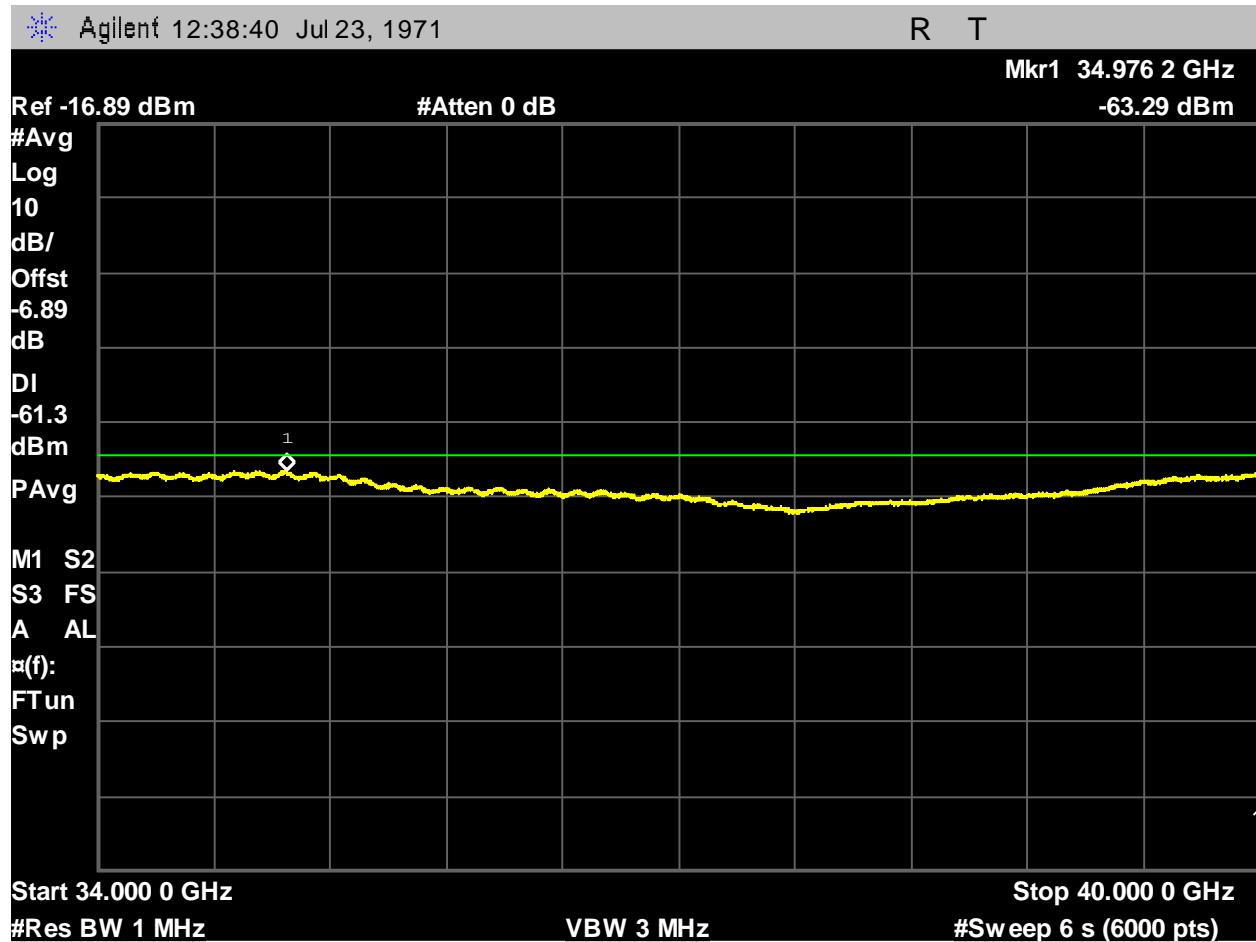


Figure 51. UWT-7010_Radiated Spurious Emissions_2mbp_34-40 GHz_V

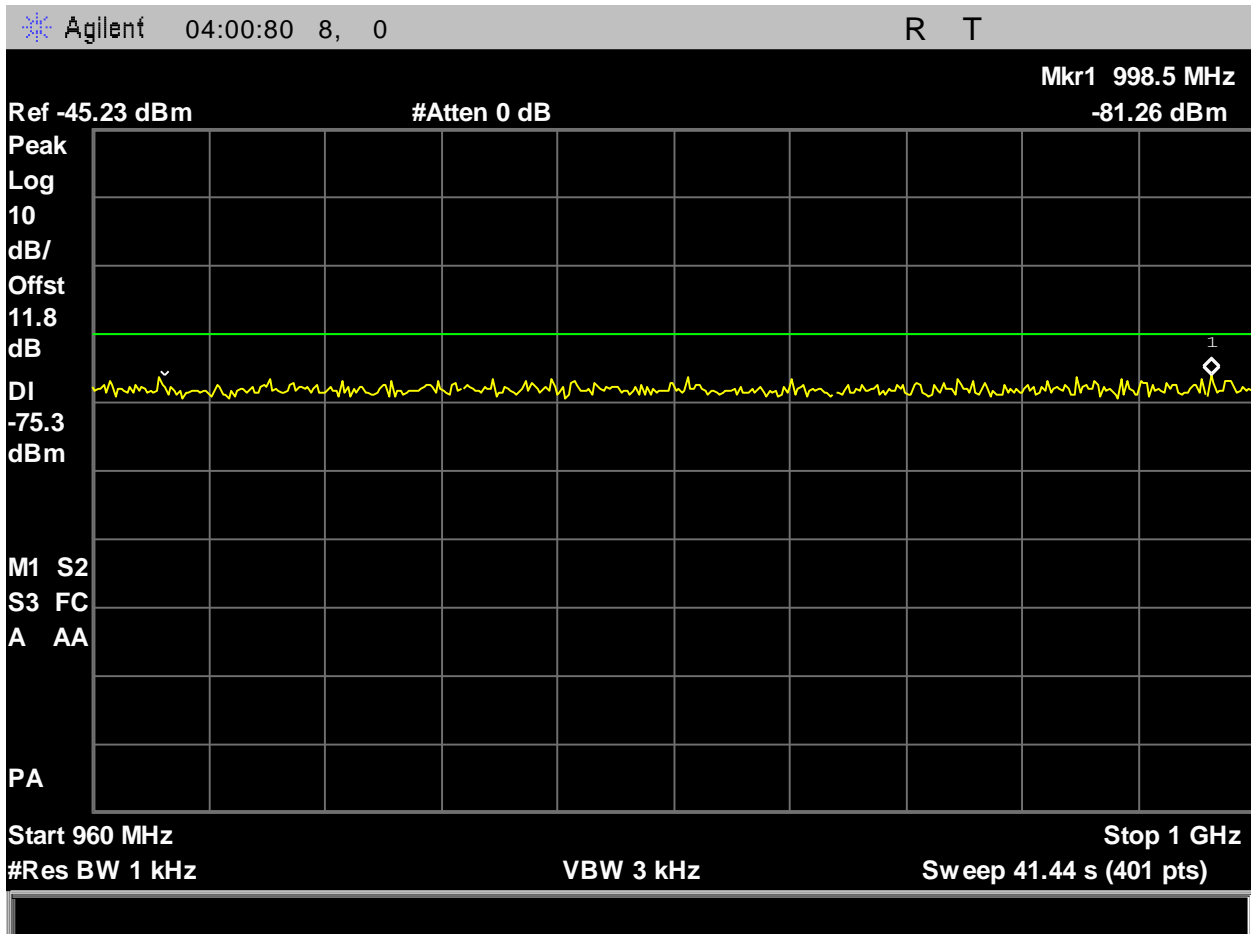


Figure 52. UWT-7010_Radiated Spurious Emissions_2mbp_960-1000 MHz_H

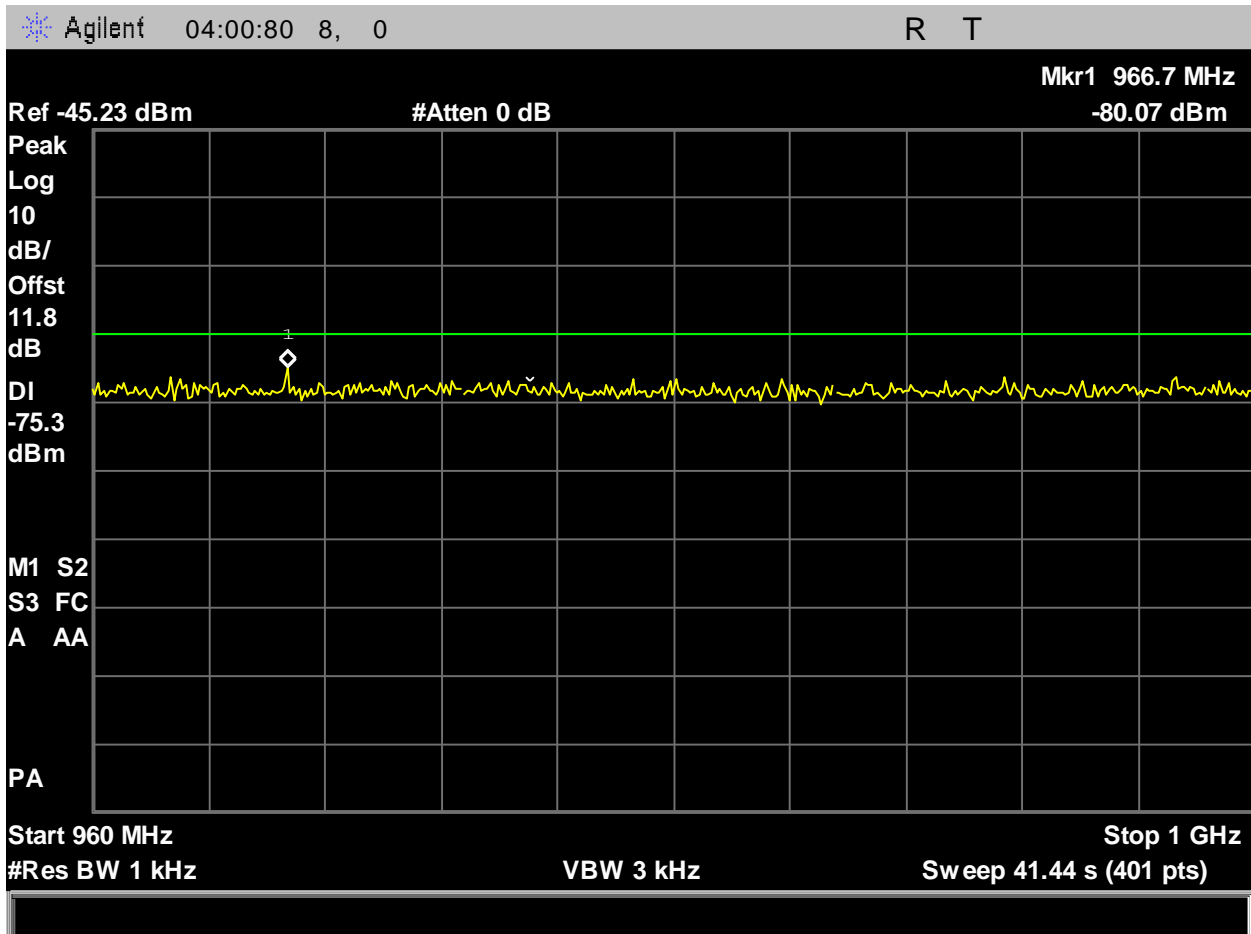


Figure 53. UWT-7010_Radiated Spurious Emissions_2mbp_960-1000 MHz_V

§ 15.519(d) Radiated Emissions – GPS Bands

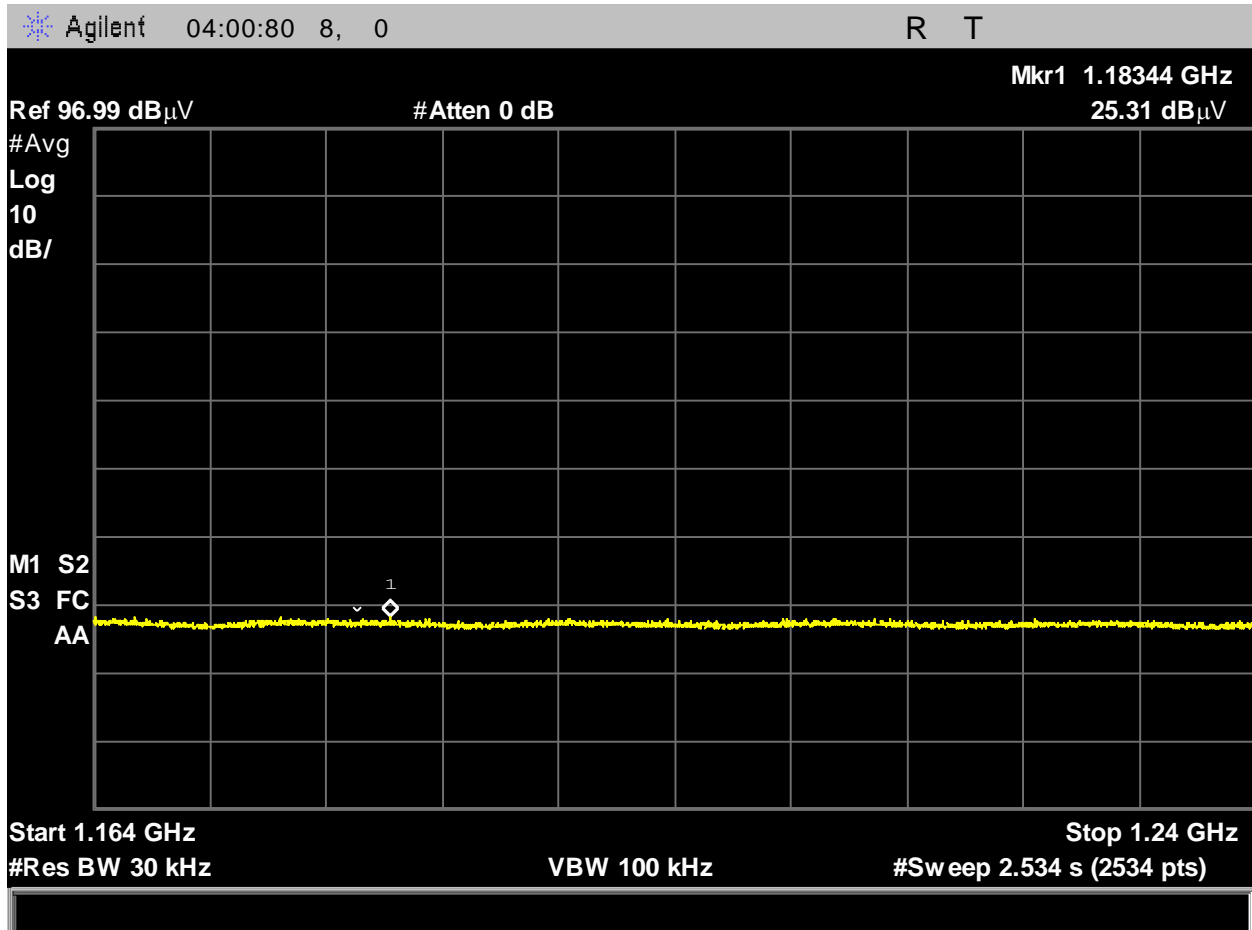


Figure 54. UWT-7010_spectral density lines 1164-1240 MHz_H_4407

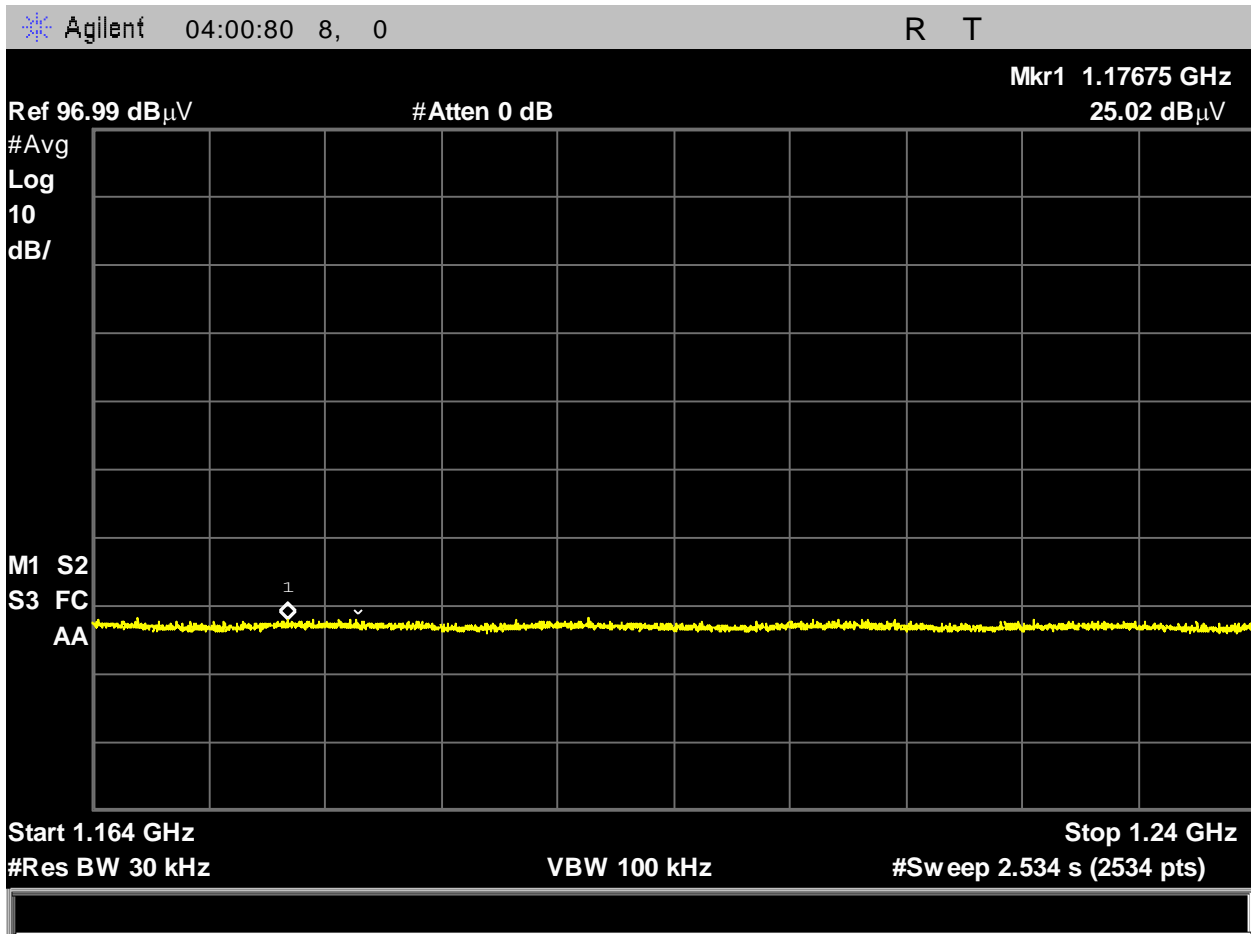


Figure 55. UWT-7010_spectral density lines 1164-1240 MHz_V_4407

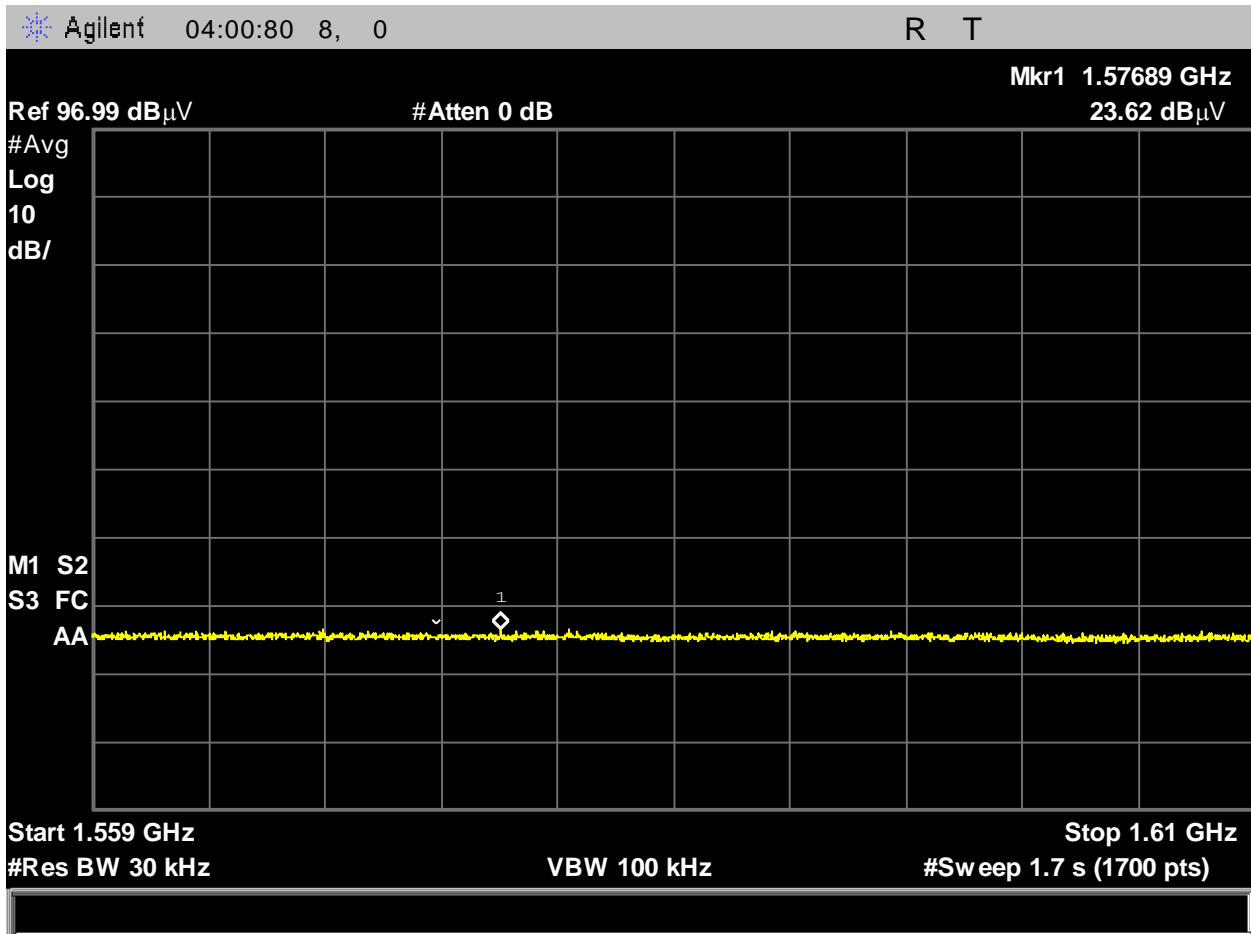


Figure 56. UWT-7010_spectral density lines 1559-1610 MHz_H_4407

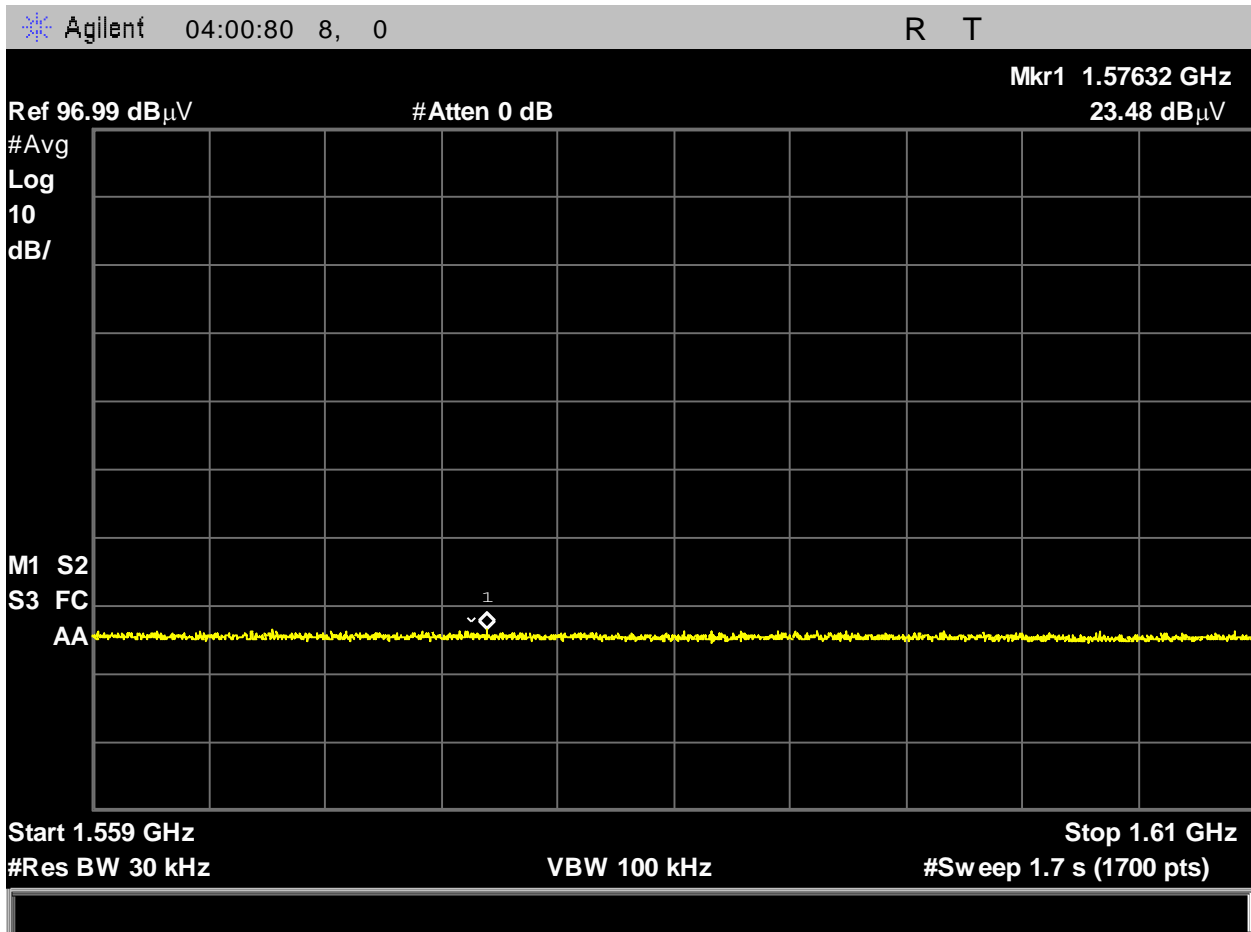
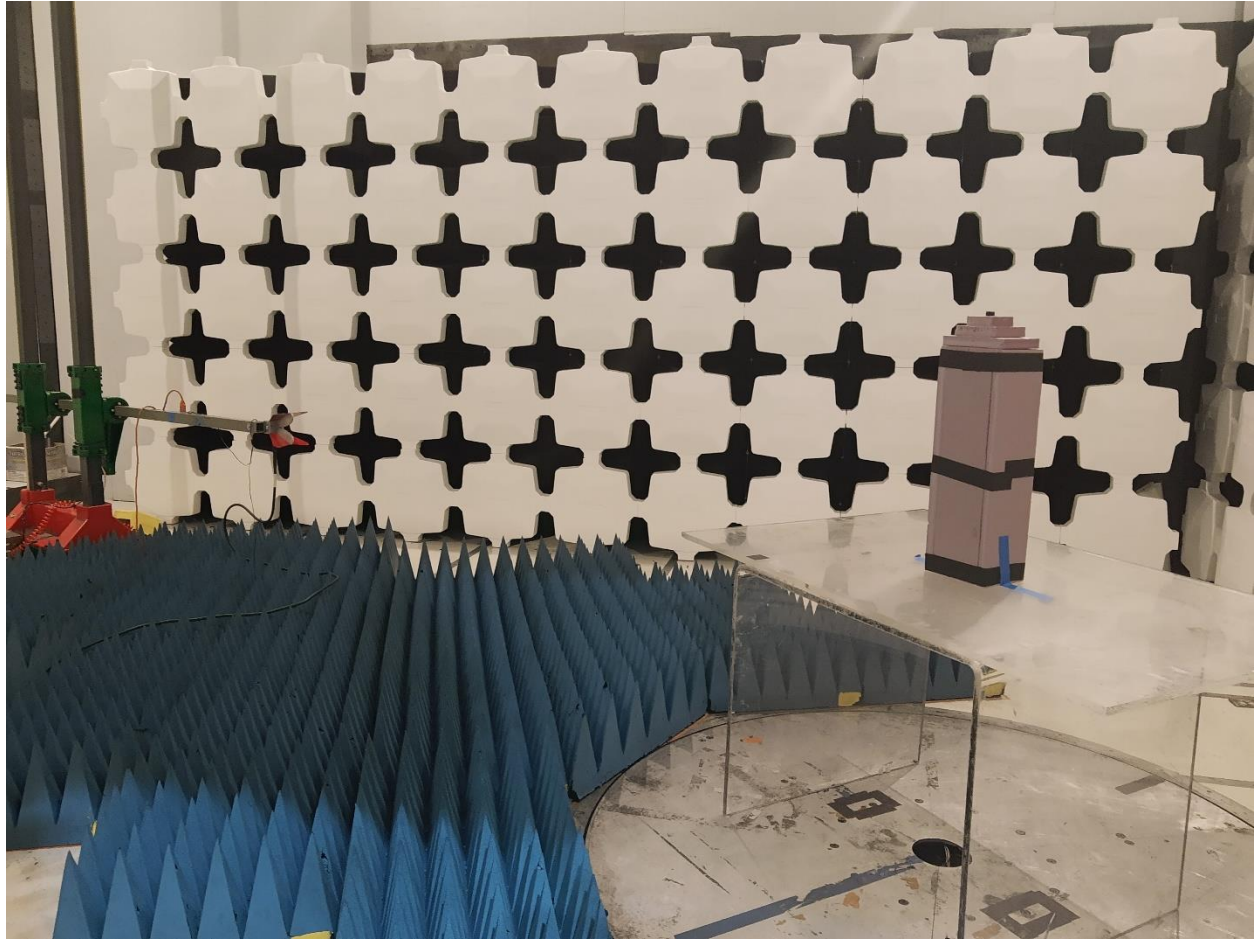


Figure 57. UWT-7010_spectral density lines 1559-1610 MHz_V_4407

§ 15.519(c)(e) Peak and Average Power Emissions



Photograph 1. Radiated Spurious Emissions Test Setup, Output Power

1	UWT-7010	E4AA	(E): E-field level * (dBuV/m)	(A): Read Level @ S/A (dBuV)	(Fc): Cable Loss (dB)	(Fa): Antenna Factor (dB/m)	(Gpa): Preamp gain (dB)	Ant height (cm)	Turntable (degree)	EIRP level ** (dBm/3MHz for PK, dBm/MHz for AV)	FCC Limit Line *** (RBW=3MHz for PK, RBW=1MHz for AV)	Margin (dB)	Result
X	V	Peak	69.8	60.99	11.99	35.72	38.9	100	356.1	-25.4	-24.44	-0.96	PASS
		Avg	50.51	41.7	11.99	35.72	38.9			-44.69	-41.3	-3.39	PASS
	H	Peak	60.45	51.65	11.99	35.71	38.9	112	78.5	-34.75	-24.44	-10.31	PASS
		Avg	42.1	33.3	11.99	35.71	38.9			-53.1	-41.3	-11.80	PASS
Y	V	Peak	65.82	57.01	11.99	35.72	38.9	309	113.7	-29.38	-24.44	-4.94	PASS
		Avg	47.33	38.52	11.99	35.72	38.9			-47.87	-41.3	-6.57	PASS
	H	Peak	70.58	61.78	11.99	35.71	38.9	117	176.7	-24.62	-24.44	-0.18	PASS
		Avg	51.65	42.85	11.99	35.71	38.9			-43.55	-41.3	-2.25	PASS
Z	V	Peak	66.35	57.54	11.99	35.72	38.9	315	135.7	-28.85	-24.44	-4.41	PASS
		Avg	47.09	38.28	11.99	35.72	38.9			-48.11	-41.3	-6.81	PASS
	H	Peak	69.74	60.94	11.99	35.71	38.9	116	178.5	-25.46	-24.44	-1.02	PASS
		Avg	50.66	41.86	11.99	35.71	38.9			-44.54	-41.3	-3.24	PASS

Table 2. UWT-7010, Output Power Test Results, 1mbps

1	UWT-7010	E4AA	(E): E-field level * (dBuV/m)	(A): Read Level @ S/A (dBuV)	(Fc): Cable Loss (dB)	(FA): Antenna Factor (dB/m)	(GPA): Preamp gain (dB)	Ant height (cm)	Turntable (degree)	EIRP level ** (dBm/3MHz for PK, dBm/MHz for AV)	FCC Limit Line *** (RBW=3MHz for PK, RBW=1MHz for AV)	Margin (dB)	Result
X	V	Peak	70.35	61.54	11.99	35.72	38.9	102	59.6	-24.85	-24.44	-0.41	PASS
		Avg	49.02	40.21	11.99	35.72	38.9			-46.18	-41.3	-4.88	PASS
	H	Peak	60.44	51.64	11.99	35.71	38.9	117	60.2	-34.76	-24.44	-10.32	PASS
		Avg	41.7	32.9	11.99	35.71	38.9			-53.5	-41.3	-12.20	PASS
Y	V	Peak	65.63	56.82	11.99	35.72	38.9	309	112	-29.57	-24.44	-5.13	PASS
		Avg	44.51	35.7	11.99	35.72	38.9			-50.69	-41.3	-9.39	PASS
	H	Peak	69.98	61.18	11.99	35.71	38.9	100	176.9	-25.22	-24.44	-0.78	PASS
		Avg	48.41	39.61	11.99	35.71	38.9			-46.79	-41.3	-5.49	PASS
Z	V	Peak	65.71	56.9	11.99	35.72	38.9	315	136.8	-29.49	-24.44	-5.05	PASS
		Avg	45.33	36.52	11.99	35.72	38.9			-49.87	-41.3	-8.57	PASS
	H	Peak	69.54	60.74	11.99	35.71	38.9	112	200.1	-25.66	-24.44	-1.22	PASS
		Avg	48.27	39.47	11.99	35.71	38.9			-46.93	-41.3	-5.63	PASS

Table 3. UWT-7010, Output Power Test Results, 2mbps

Additional Testing Per FCC Waiver

Fundamental Emission contained within 7125-7900MHz

Fm =	7.425	GHz
FL =	7.16	GHz
FH =	7.76	GHz
-10dB BW	600	MHz

Table 4. -10dB bandwidth calc

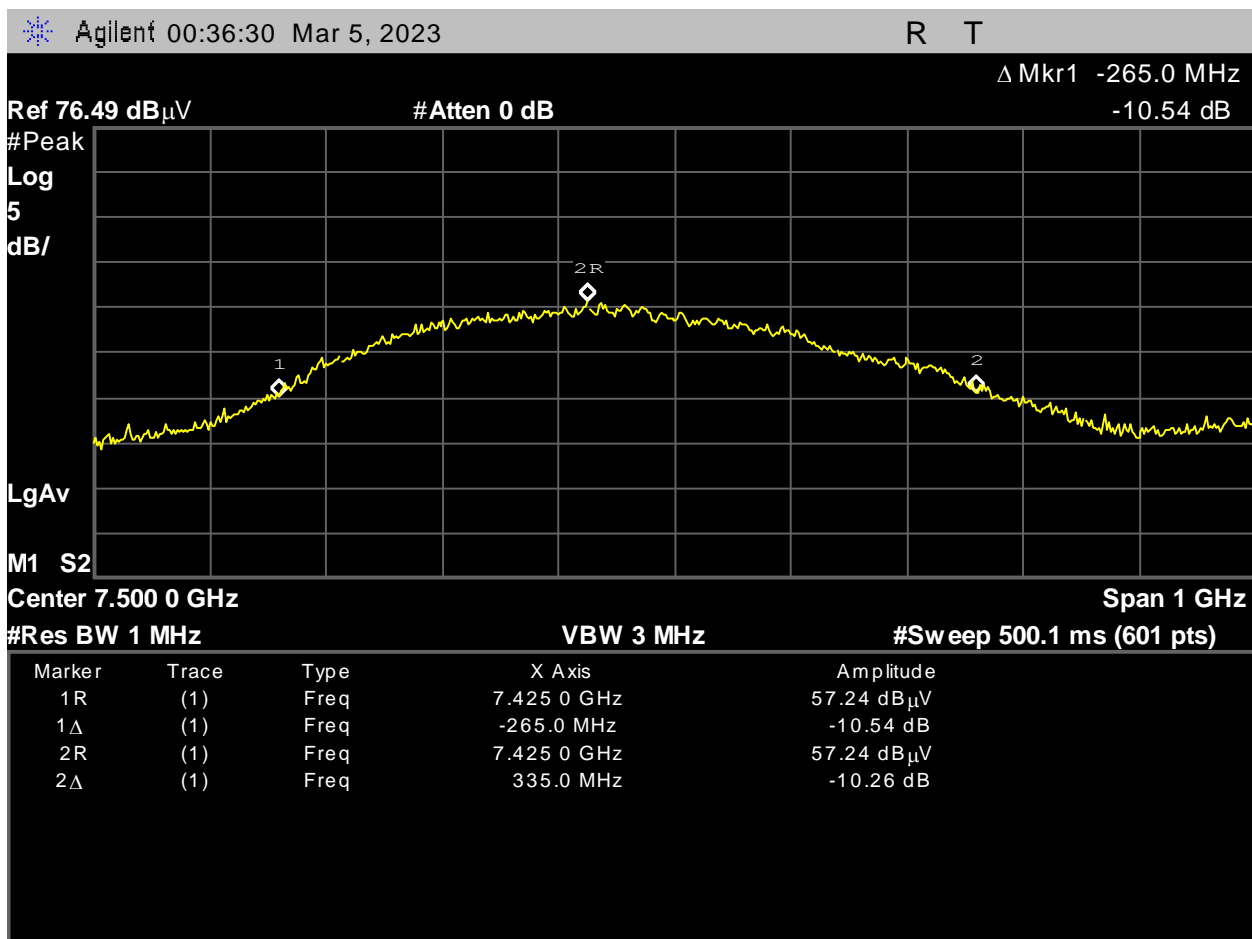


Figure 58. -10dB BW

Pulse width 2.5ns



Figure 59. Pulse Width

Number of pulses/s

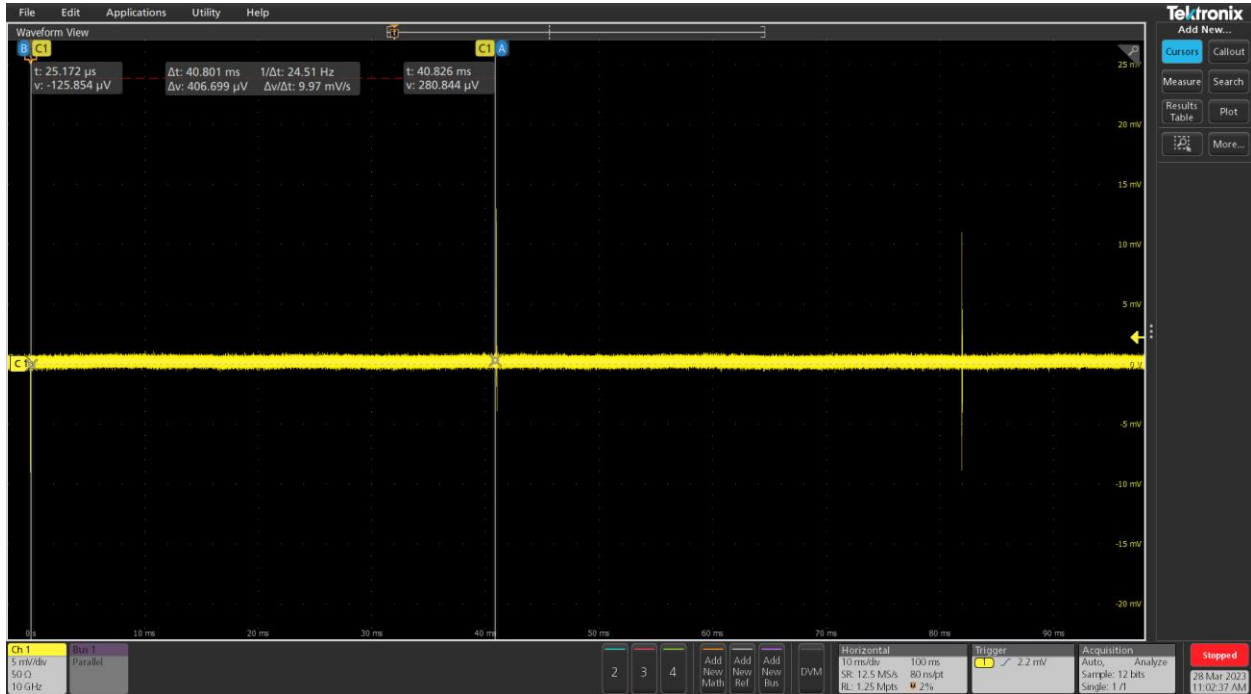


Figure 60. Burst Period

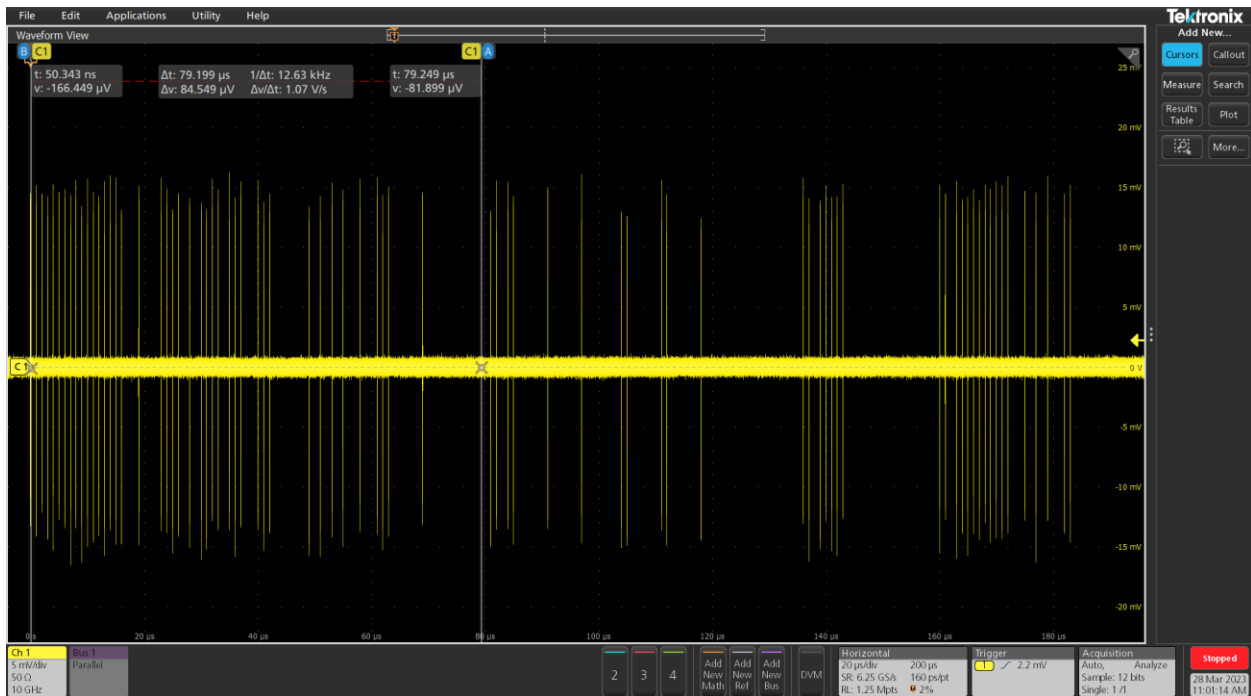


Figure 61. Pulses per Burst

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Max EIRP -41.3dBm/MHz

1	UWT-7010	E4AA											
Plane	Pol	Remark	(E): E-field level * (dBuV/m)	(A): Read Level @ S/A (dBuV)	(Fc): Cable Loss (dB)	(Fa): Antenna Factor (dB/m)	(Gpa): Preamp gain (dB)	Ant height (cm)	Turntable (degree)	EIRP level ** (dBm/3MHz for PK, dBm/MHz for AV)	FCC Limit Line *** (RBW=3MHz for PK, RBW=1MHz for AV)	Margin (dB)	Result
X	V	Peak	69.8	60.99	11.99	35.72	38.9	100	356.1	-25.4	-24.44	-0.96	PASS
		Avg	50.51	41.7	11.99	35.72	38.9			-44.69	-41.3	-3.39	PASS
	H	Peak	60.45	51.65	11.99	35.71	38.9	112	78.5	-34.75	-24.44	-10.31	PASS
		Avg	42.1	33.3	11.99	35.71	38.9			-53.1	-41.3	-11.80	PASS
Y	V	Peak	65.82	57.01	11.99	35.72	38.9	309	113.7	-29.38	-24.44	-4.94	PASS
		Avg	47.33	38.52	11.99	35.72	38.9			-47.87	-41.3	-6.57	PASS
	H	Peak	70.58	61.78	11.99	35.71	38.9	117	176.7	-24.62	-24.44	-0.18	PASS
		Avg	51.65	42.85	11.99	35.71	38.9			-43.55	-41.3	-2.25	PASS
Z	V	Peak	66.35	57.54	11.99	35.72	38.9	315	135.7	-28.85	-24.44	-4.41	PASS
		Avg	47.09	38.28	11.99	35.72	38.9			-48.11	-41.3	-6.81	PASS
	H	Peak	69.74	60.94	11.99	35.71	38.9	116	178.5	-25.46	-24.44	-1.02	PASS
		Avg	50.66	41.86	11.99	35.71	38.9			-44.54	-41.3	-3.24	PASS

Table 5. UWT-7010, Output Power Test Results, 1mbps

1	UWT-7010	E4AA											
Plane	Pol	Remark	(E): E-field level * (dBuV/m)	(A): Read Level @ S/A (dBuV)	(Fc): Cable Loss (dB)	(Fa): Antenna Factor (dB/m)	(Gpa): Preamp gain (dB)	Ant height (cm)	Turntable (degree)	EIRP level ** (dBm/3MHz for PK, dBm/MHz for AV)	FCC Limit Line *** (RBW=3MHz for PK, RBW=1MHz for AV)	Margin (dB)	Result
X	V	Peak	70.35	61.54	11.99	35.72	38.9	102	59.6	-24.85	-24.44	-0.41	PASS
		Avg	49.02	40.21	11.99	35.72	38.9			-46.18	-41.3	-4.88	PASS
	H	Peak	60.44	51.64	11.99	35.71	38.9	117	60.2	-34.76	-24.44	-10.32	PASS
		Avg	41.7	32.9	11.99	35.71	38.9			-53.5	-41.3	-12.20	PASS
Y	V	Peak	65.63	56.82	11.99	35.72	38.9	309	112	-29.57	-24.44	-5.13	PASS
		Avg	44.51	35.7	11.99	35.72	38.9			-50.69	-41.3	-9.39	PASS
	H	Peak	69.98	61.18	11.99	35.71	38.9	100	176.9	-25.22	-24.44	-0.78	PASS
		Avg	48.41	39.61	11.99	35.71	38.9			-46.79	-41.3	-5.49	PASS
Z	V	Peak	65.71	56.9	11.99	35.72	38.9	315	136.8	-29.49	-24.44	-5.05	PASS
		Avg	45.33	36.52	11.99	35.72	38.9			-49.87	-41.3	-8.57	PASS
	H	Peak	69.54	60.74	11.99	35.71	38.9	112	200.1	-25.66	-24.44	-1.22	PASS
		Avg	48.27	39.47	11.99	35.71	38.9			-46.93	-41.3	-5.63	PASS

Table 6. UWT-7010, Output Power Test Results, 2mbps