

7.5. Number of Hopping Channels Measurement

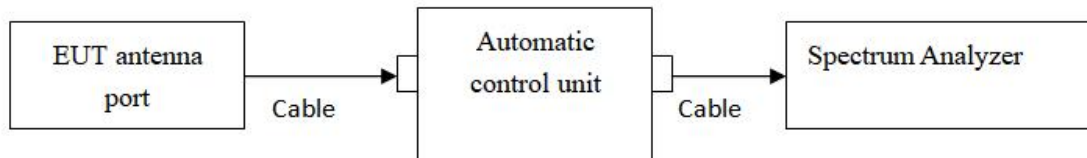
7.5.1. Test Limit

Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.

7.5.2. Test Setting

- 1) Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2) Set the spectrum analyzer as RBW=100kHz, VBW=300kHz. Set the spectrum analyzer: start frequency = 2400MHz. stop frequency = 2483.5MHz. Submit the test result graph.

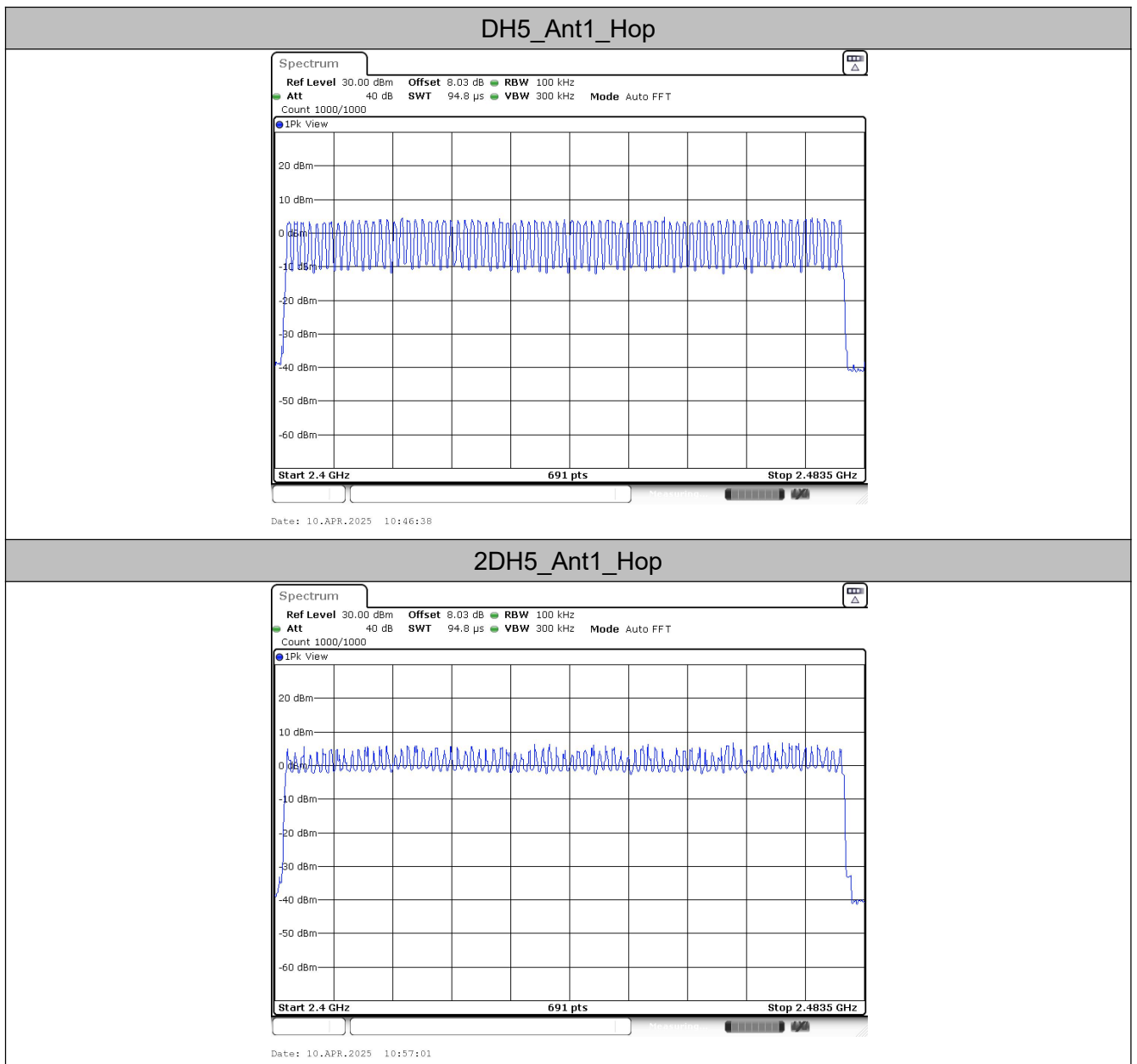
7.5.3. Test Setup



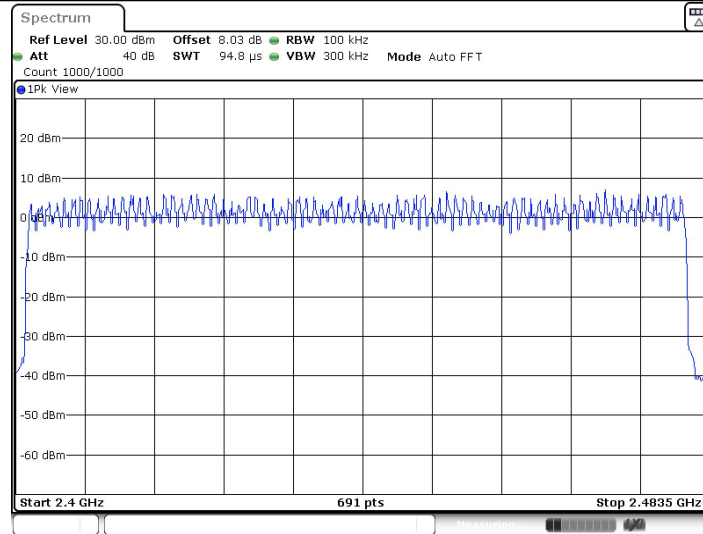
7.5.4. Test Result

Test Mode	Antenna	Channel	Result[Num]	Limit[Num]	Verdict
DH5	Ant1	Hop	79	≥ 15	PASS
2DH5	Ant1	Hop	79	≥ 15	PASS
3DH5	Ant1	Hop	79	≥ 15	PASS

Test Graphs



3DH5_Ant1_Hop



7.6. Time of Occupancy Measurement

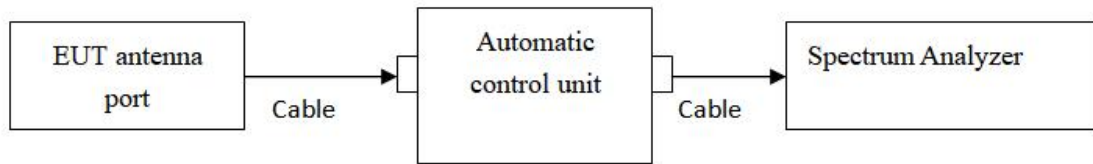
7.6.1. Test Limit

Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

7.6.2. Test Setting

- 1) Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 1) Set spectrum analyzer span = 0. centered on a hopping channel;
- 2) Set RBW = 1MHz and VBW = 3MHz. Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Clear Write;
- 3) Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). Repeat this test for each variation.
- 4) DH1 Packet permit maximum $1600 / 79 / 2 = 10.12$ hops per second in each channel (1 time slot TX, 1 time slot RX). So the dwell time is the time duration of the pulse times $10.12 \times 31.6 = 320$ within 31.6 seconds
- 5) DH3 Packet permit maximum $1600 / 79 / 4 = 5.06$ hops per second in each channel (3 time slotsTX, 1 time slot RX). So the dwell time is the time duration of the pulse times $5.06 \times 31.6 = 160$ within 31.6 seconds
- 6) DH5 Packet permit maximum $1600 / 79 / 6 = 3.37$ hops per second in each channel (5 time slotsTX, 1 time slot RX). So the dwell time is the time duration of the pulse times $3.37 \times 31.6 = 106.6$ within 31.6 seconds

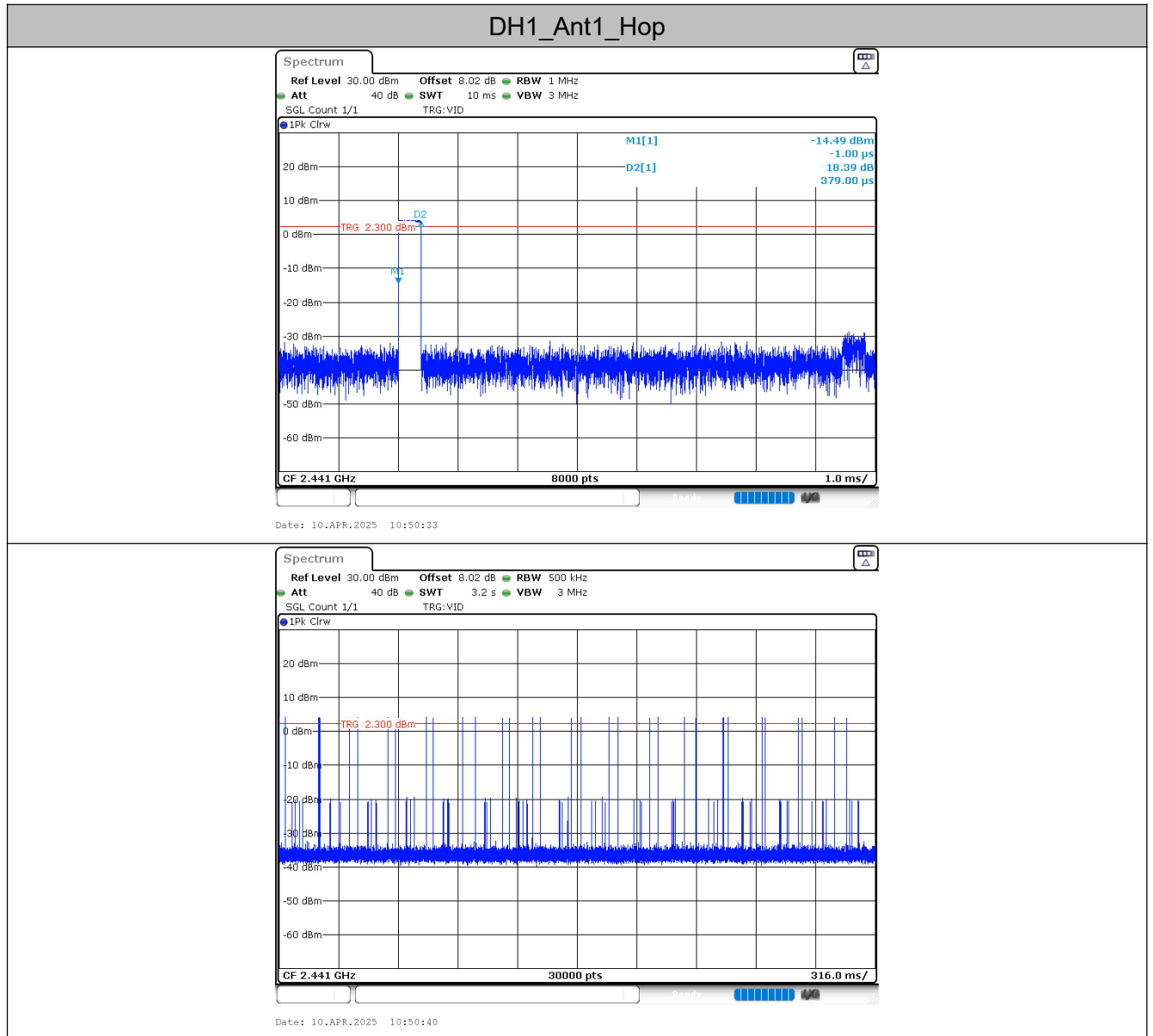
7.6.3. Test Setup



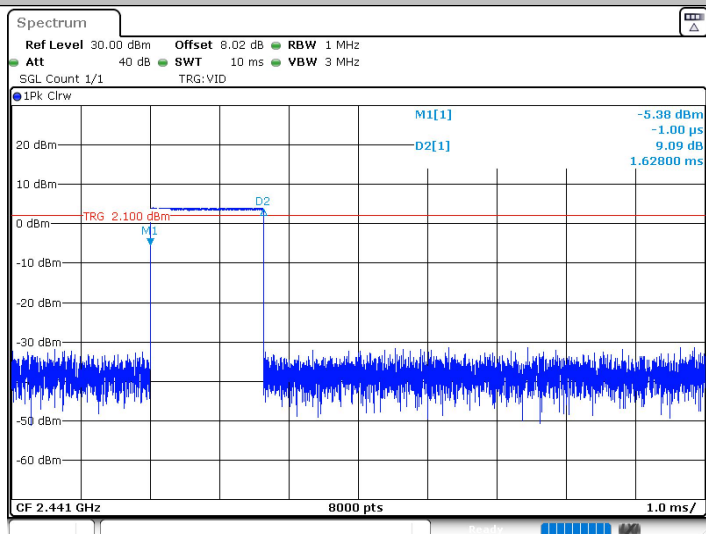
7.6.4. Test Result

Test Mode	Antenna	Channel	BurstWidth [ms]	TotalHops [Num]	Result[s]	Limit[s]	Verdict
DH1	Ant1	Hop	0.379	320	0.121	<=0.4	PASS
DH3	Ant1	Hop	1.628	140	0.228	<=0.4	PASS
DH5	Ant1	Hop	2.868	110	0.315	<=0.4	PASS
2DH1	Ant1	Hop	0.389	330	0.128	<=0.4	PASS
2DH3	Ant1	Hop	1.631	170	0.277	<=0.4	PASS
2DH5	Ant1	Hop	2.873	90	0.259	<=0.4	PASS
3DH1	Ant1	Hop	0.388	320	0.124	<=0.4	PASS
3DH3	Ant1	Hop	1.630	210	0.342	<=0.4	PASS
3DH5	Ant1	Hop	2.874	100	0.287	<=0.4	PASS

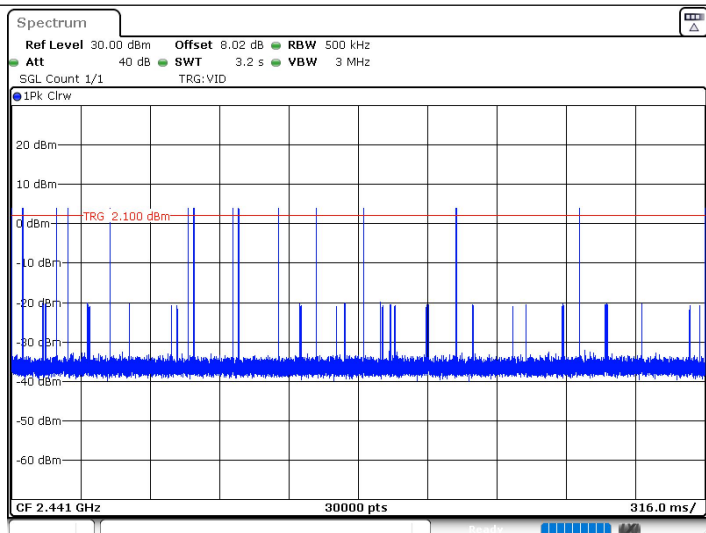
Test Graphs



DH3_Ant1_Hop

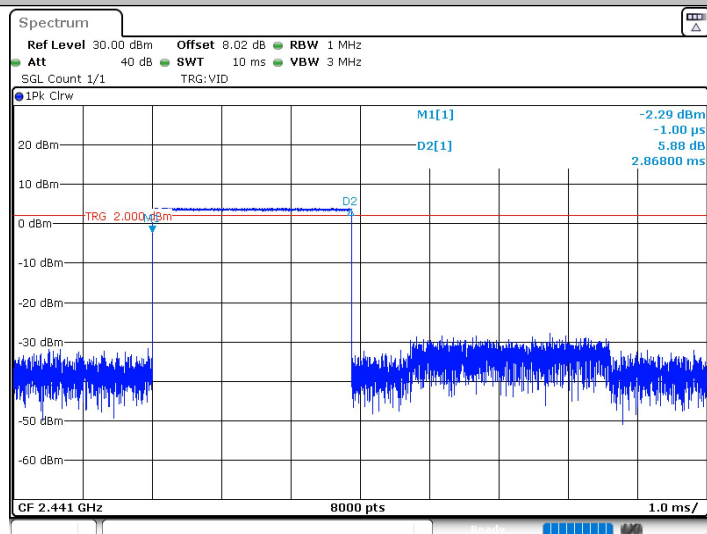


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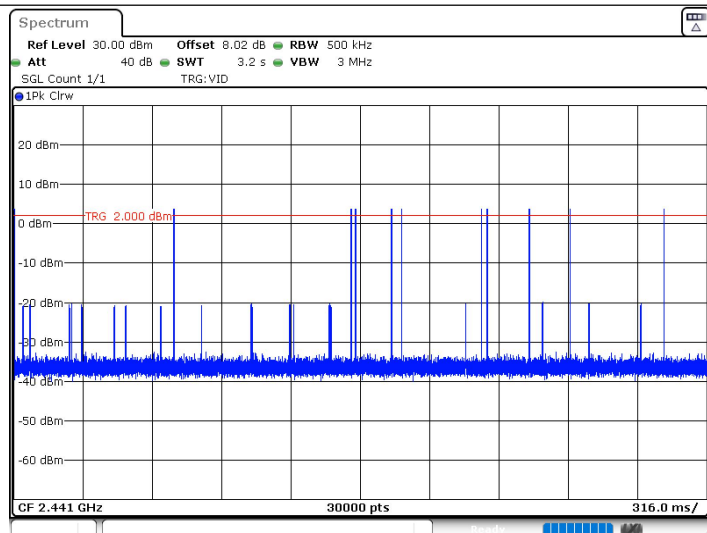


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DH5_Ant1_Hop

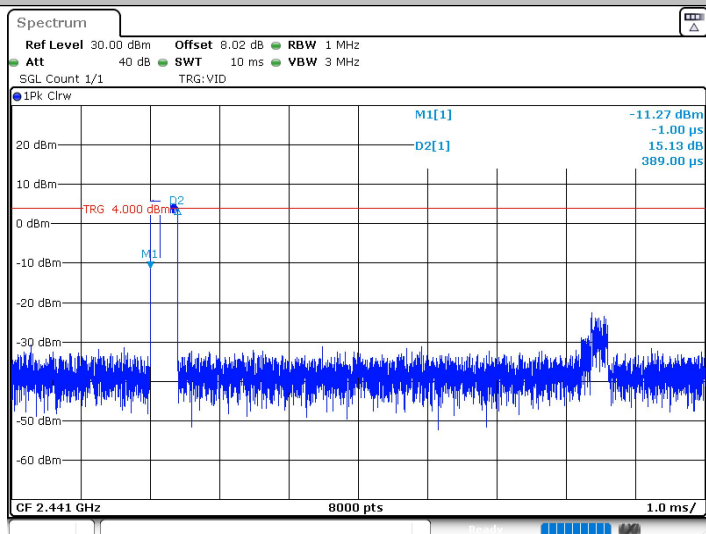


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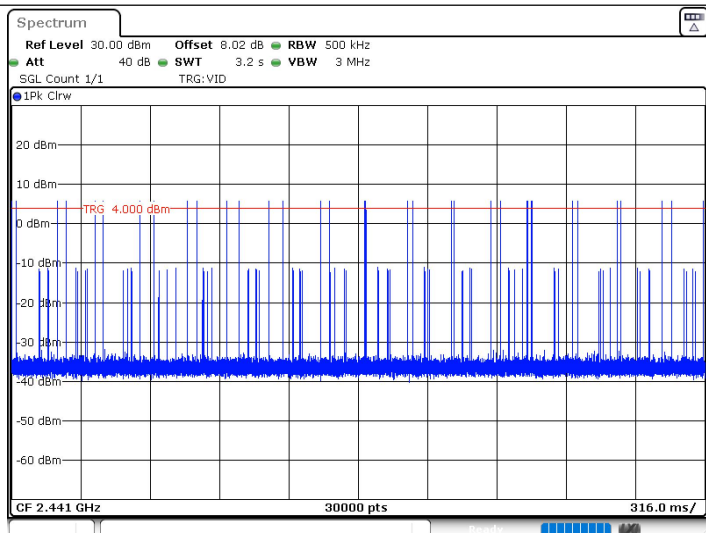


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2DH1_Ant1_Hop

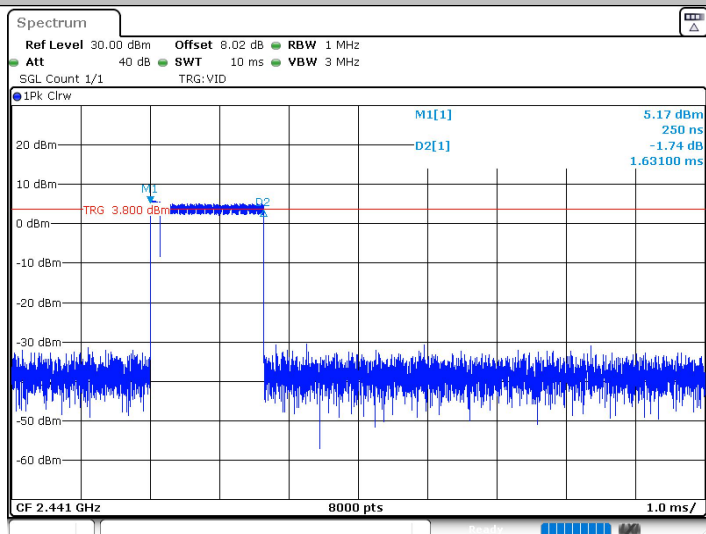


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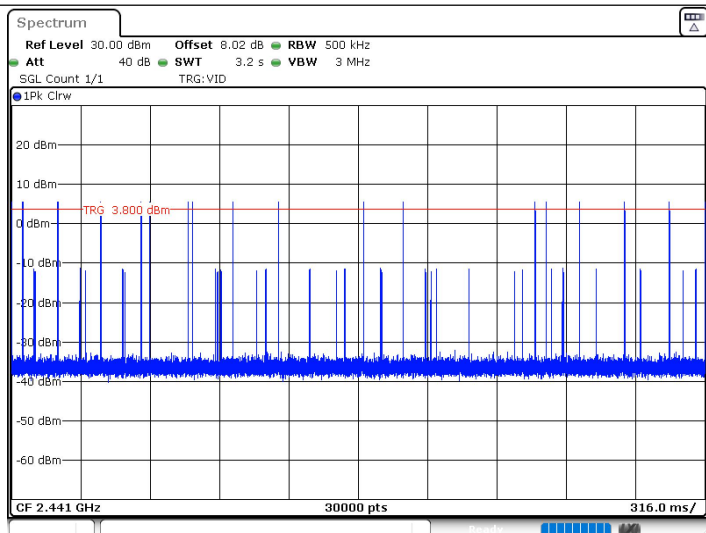


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2DH3_Ant1_Hop

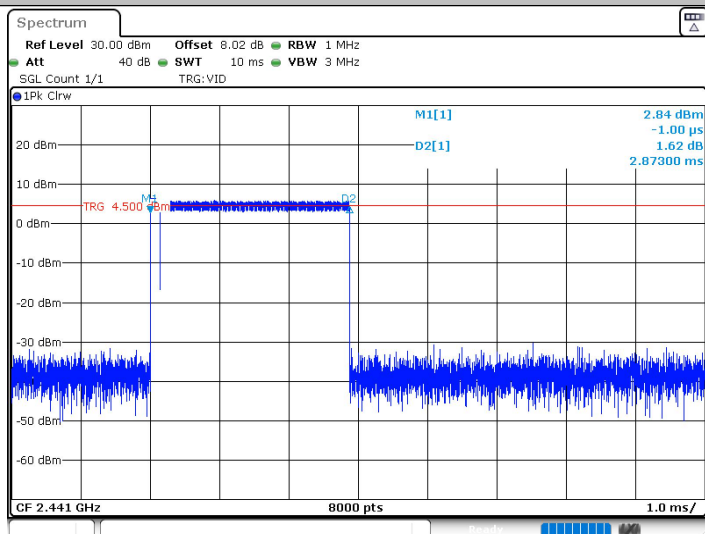


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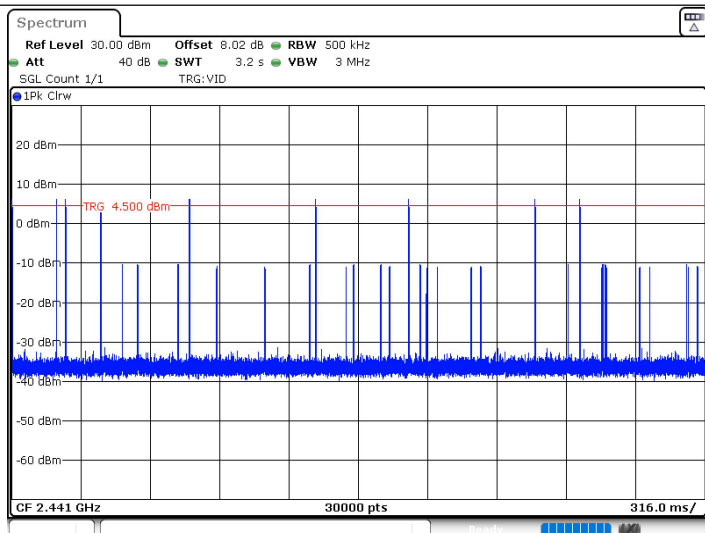


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2DH5_Ant1_Hop

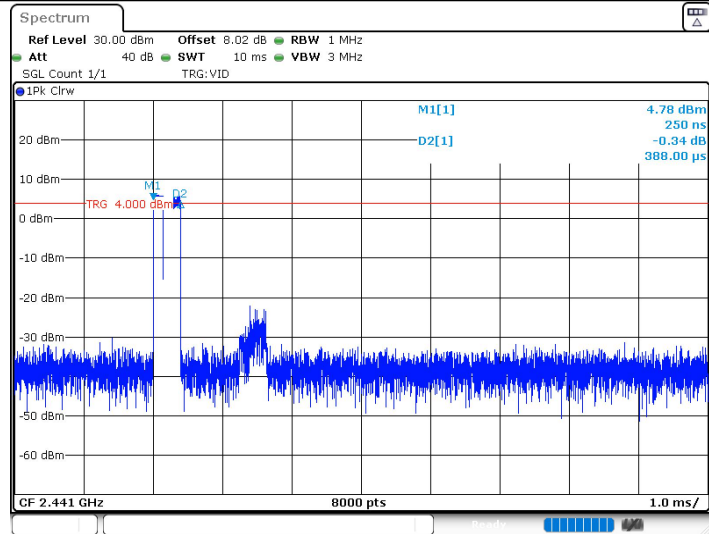


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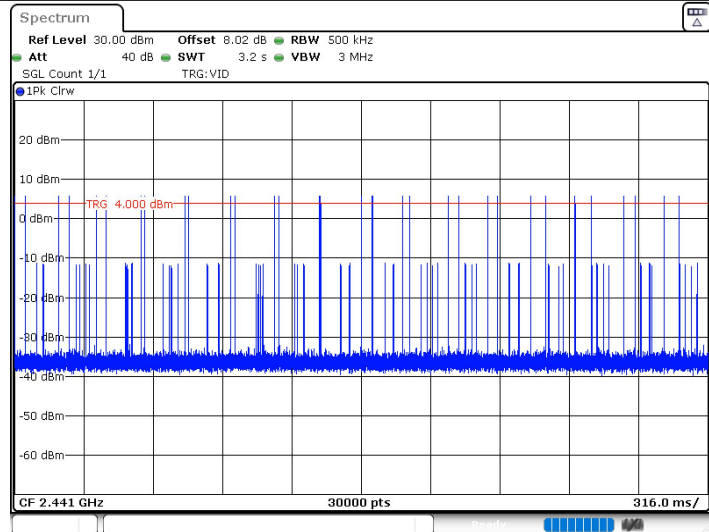


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3DH1_Ant1_Hop

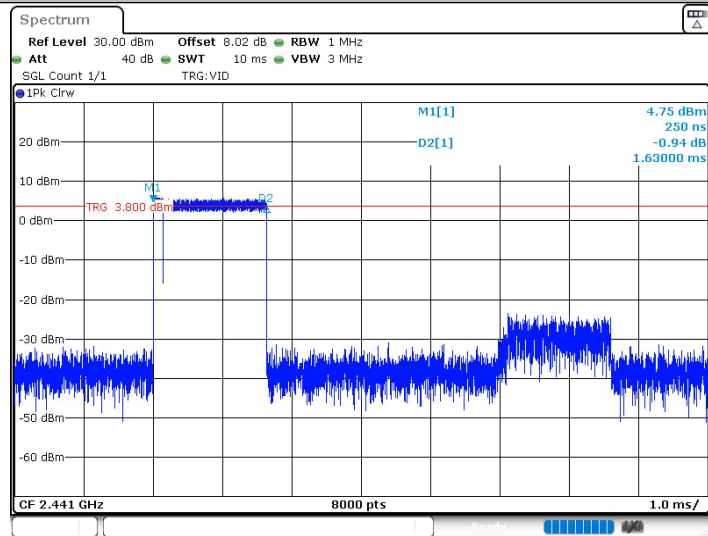


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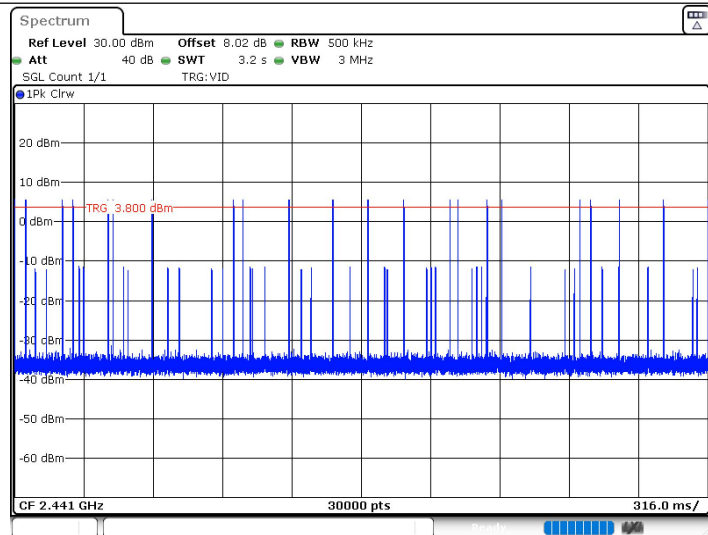


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3DH3_Ant1_Hop

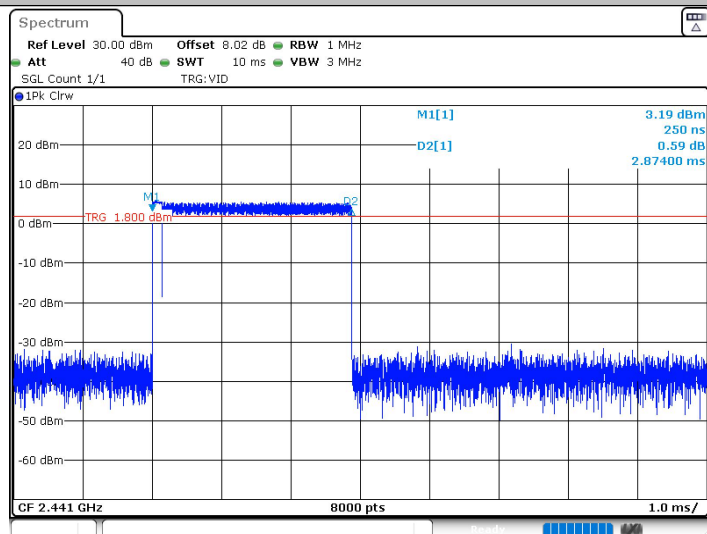


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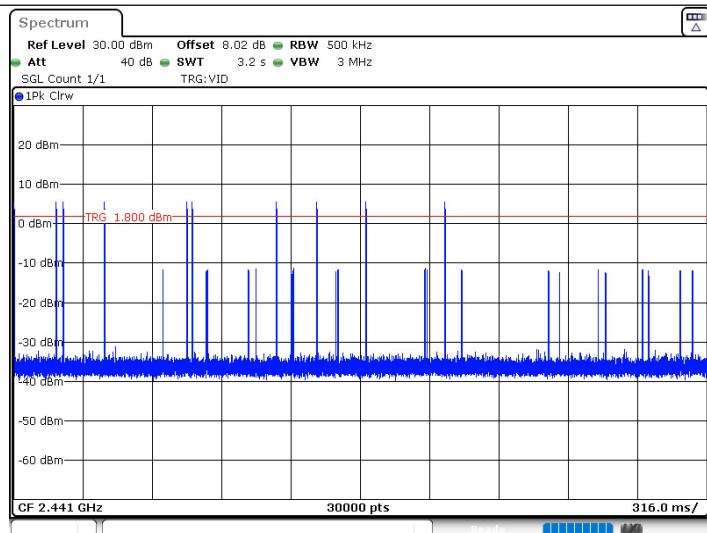


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3DH5_Ant1_Hop



Date: 10.APR.2025 11:06:11



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7.7. Band-edge Compliance & Conducted Spurious Emissions Measurement

7.7.1. Test Limit

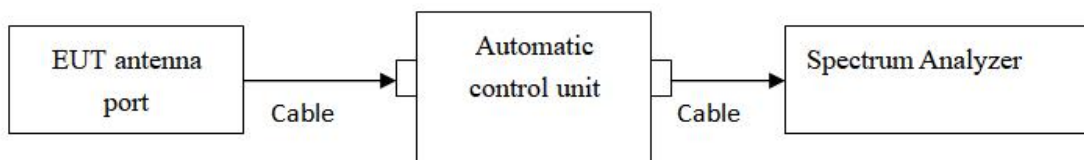
In any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30dB instead of 20dB.

7.7.2. Test Setting

Test procedures follow KDB 558074 D01 DTS Measurement Guidance v05r02.

- 1) Remove the antenna from the EUT and then connect a low attenuation cable from the antenna port to the spectrum.
- 2) Set the spectrum analyzer: RBW =100kHz; VBW =300kHz, Frequency range = 30MHz to 26.5GHz; Sweep = auto; Detector Function = Peak. Trace = Max, hold.
- 3) Measure and record the results in the test report.
- 4) The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

7.7.3. Test Setup



7.7.4. Test Result

Band Edge

Test Mode	Antenna	Ch Name	Channel	Ref Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
DH5	Ant1	Low	2402	3.17	-48.28	≤ -16.83	PASS
		High	2480	3.39	-48.3	≤ -16.61	PASS
		Low	Hop_2402	2.90	-48.23	≤ -17.1	PASS
		High	Hop_2480	2.90	-47.75	≤ -17.1	PASS
2DH5	Ant1	Low	2402	4.67	-48.49	≤ -15.33	PASS
		High	2480	5.19	-48.45	≤ -14.81	PASS
		Low	Hop_2402	4.20	-47.61	≤ -15.8	PASS
		High	Hop_2480	5.24	-48.69	≤ -14.76	PASS
3DH5	Ant1	Low	2402	4.66	-47.94	≤ -15.34	PASS
		High	2480	3.27	-48.01	≤ -16.73	PASS
		Low	Hop_2402	3.58	-48.6	≤ -16.42	PASS
		High	Hop_2480	4.42	-47.18	≤ -15.58	PASS