

NOTE:

- a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection using reduced video bandwidth (Duty cycle ≥98%) at frequency above 1GHz.
- d. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1/τ Hz, where τ is minimum transmitter on time (Duty cycle <98%) for Average detection using reduced video bandwidth at frequency above 1GHz.
- e. All modes of operation were investigated and the worst-case emissions are reported.

6.7.2. Test Limits

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

NOTE:

- d. The lower limit shall apply at the transition frequencies.
- e. Emission level (dBuV/m) = 20 log Emission level (uV/m).
- f. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

For Radiated emissions which fall out of the restricted bands must comply with the radiated emission limits specified as below table.

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v01r03		Field Strength at 3 m	
		PK: 74 (dBuV/m)	AV: 54 (dBuV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
5150-5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBuV/m)
5250-5350 MHz	15.407(b)(2)		
5470-5725 MHz	15.407(b)(3)		
5725-5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ¹¹ PK:10 (dBm/MHz) ¹² PK:15.6 (dBm/MHz) ¹³ PK:27 (dBm/MHz) ¹⁴	PK: 68.2 (dBuV/m) ¹¹ PK:105.2 (dBuV/m) ¹² PK: 110.8 (dBuV/m) ¹³ PK:122.2 (dBuV/m) ¹⁴
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
¹¹ beyond 75 MHz or more above of the band edge. ¹² below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. ¹³ below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. ¹⁴ from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

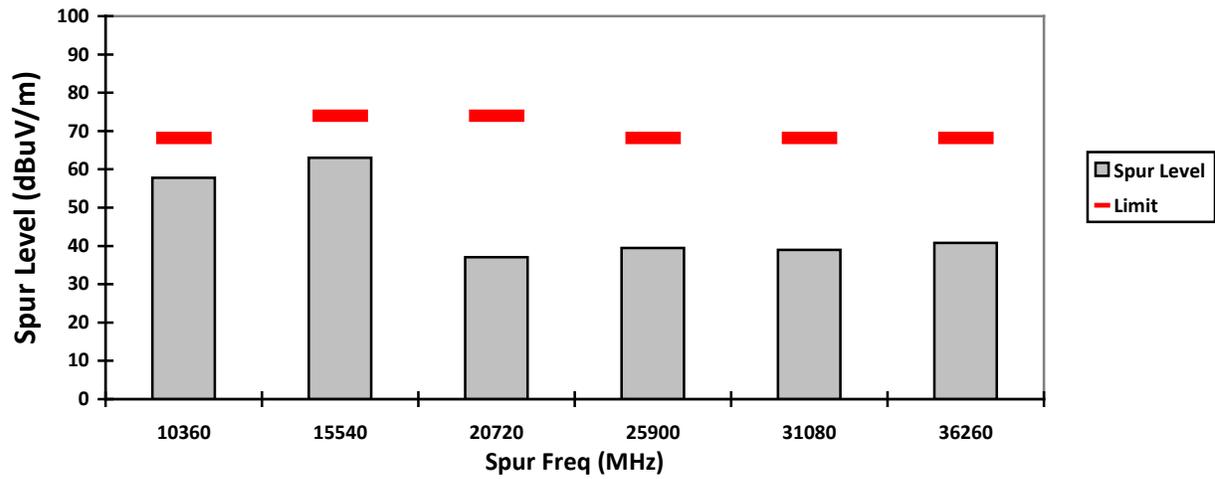
NOTE:

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

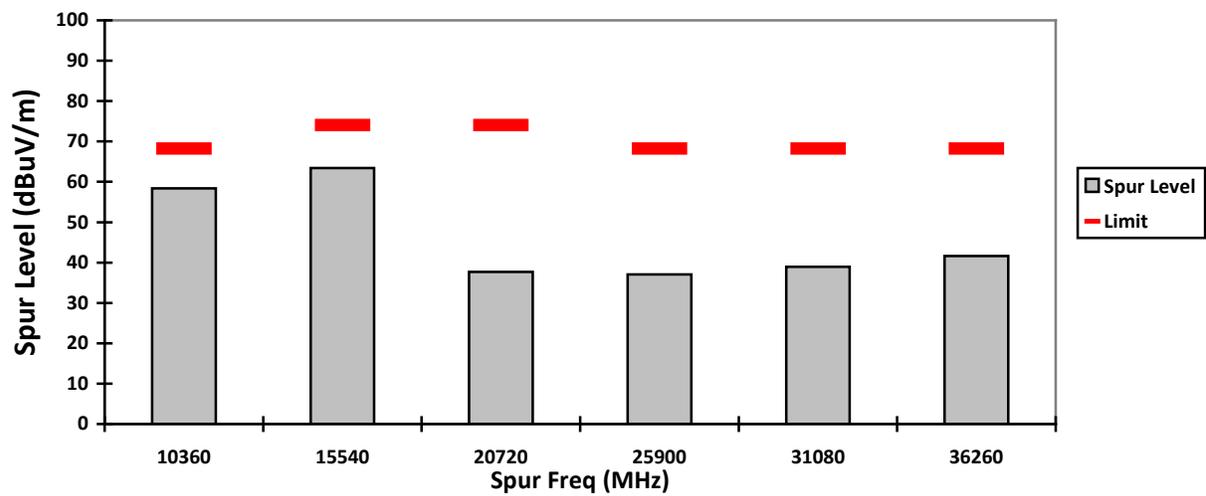
$$E = ((1000000\sqrt{30P}) / 3) \mu\text{V/m, where P is the eirp (Watts)}$$

6.7.3. Test Data

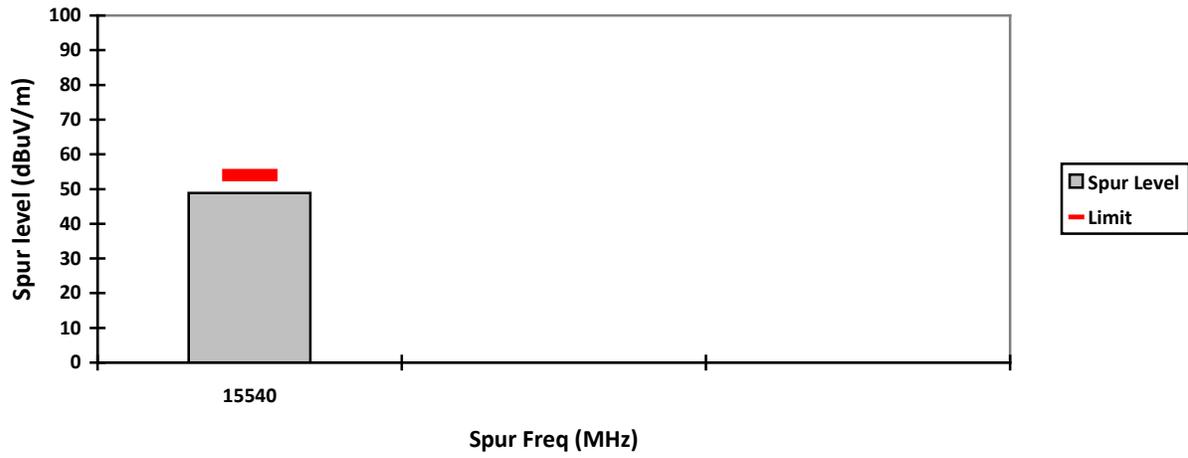
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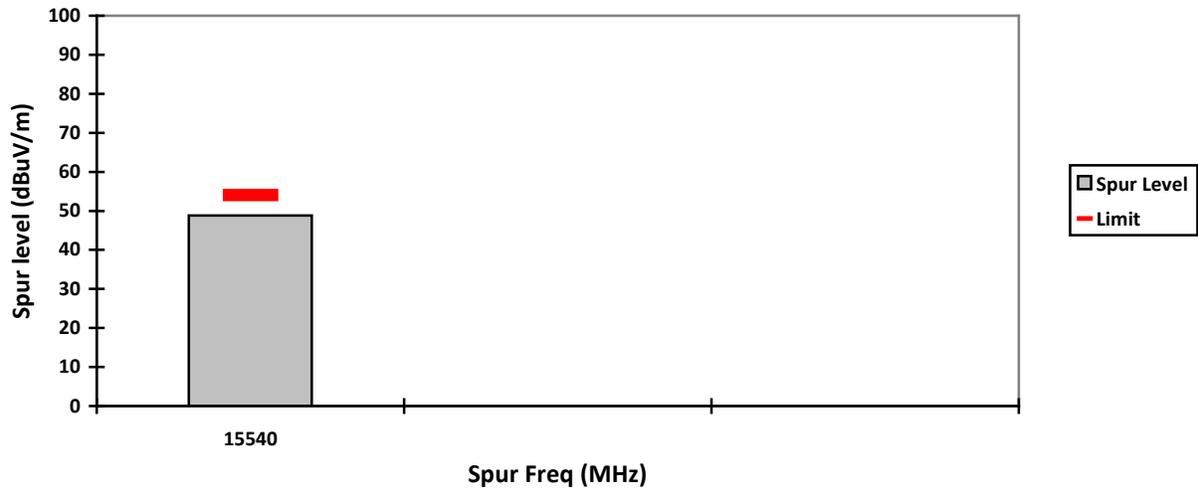
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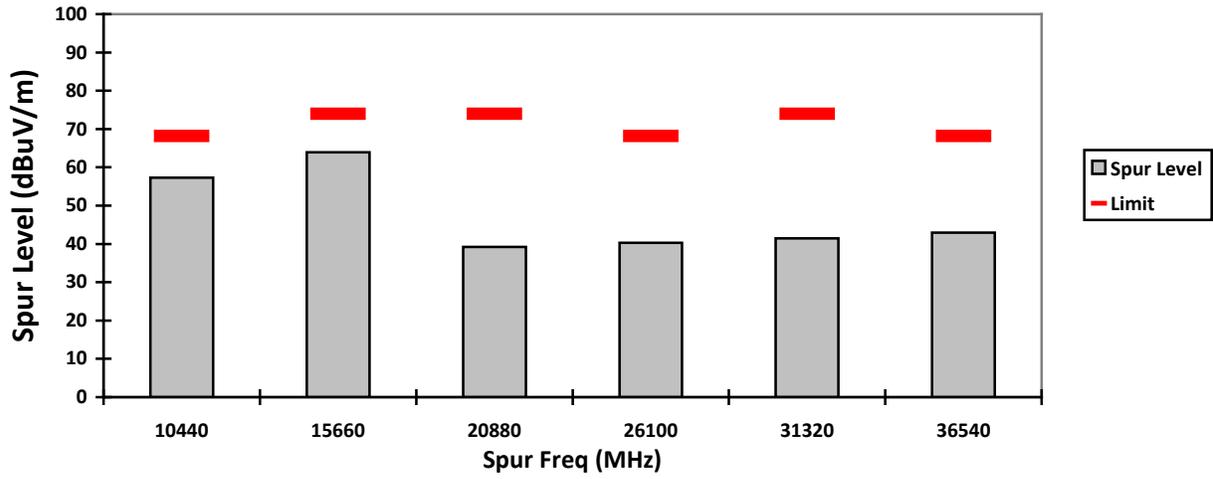
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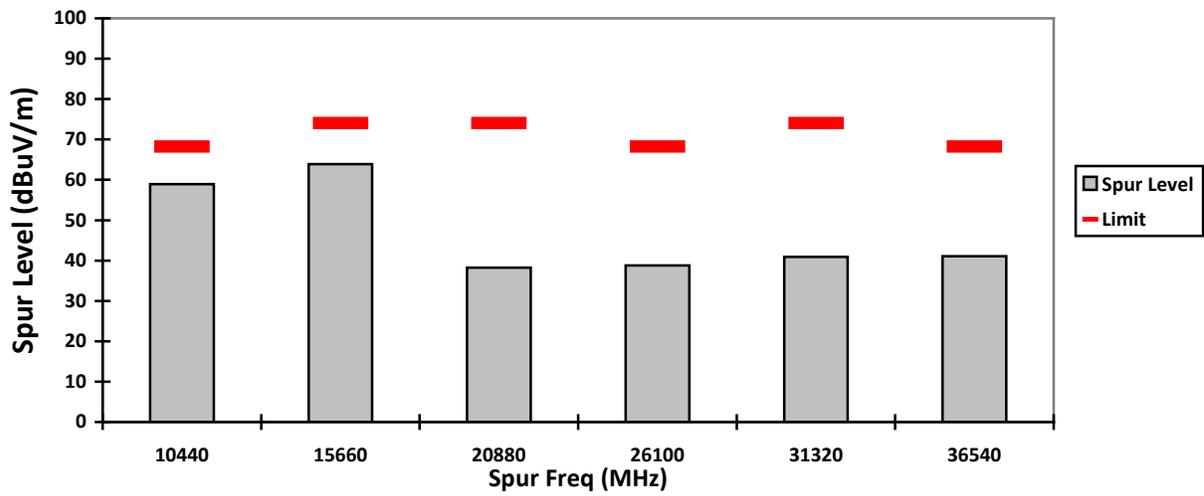
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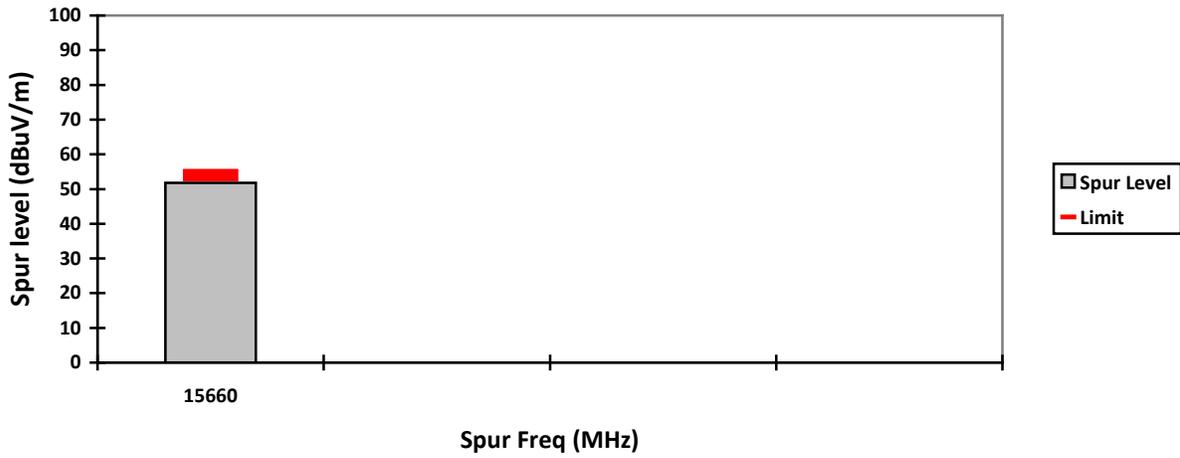
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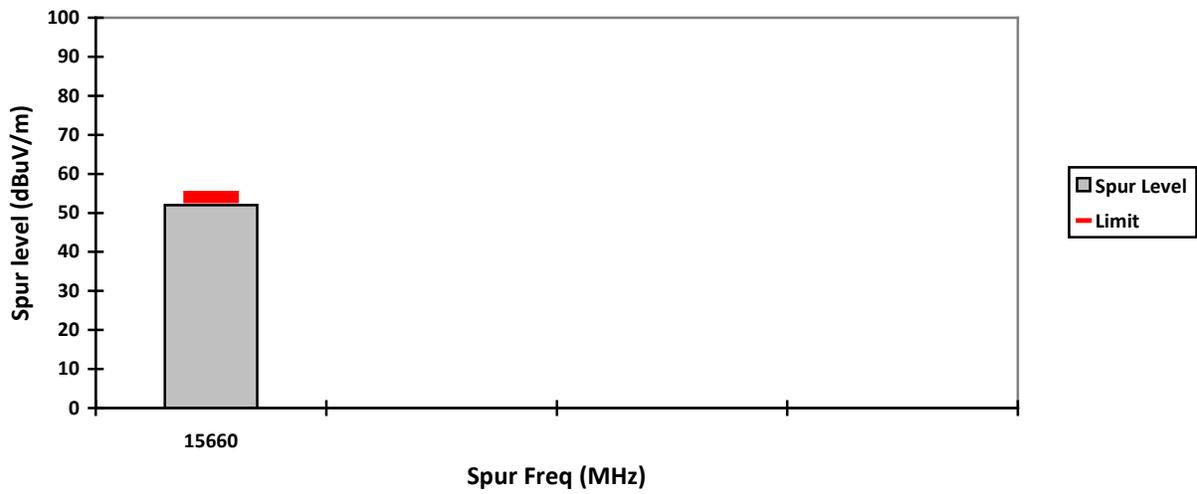
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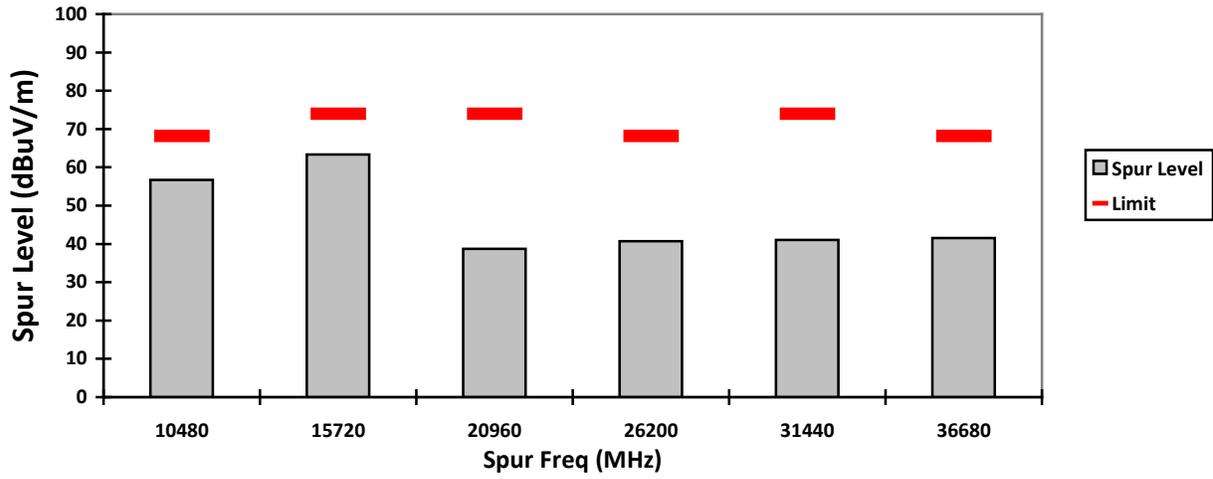
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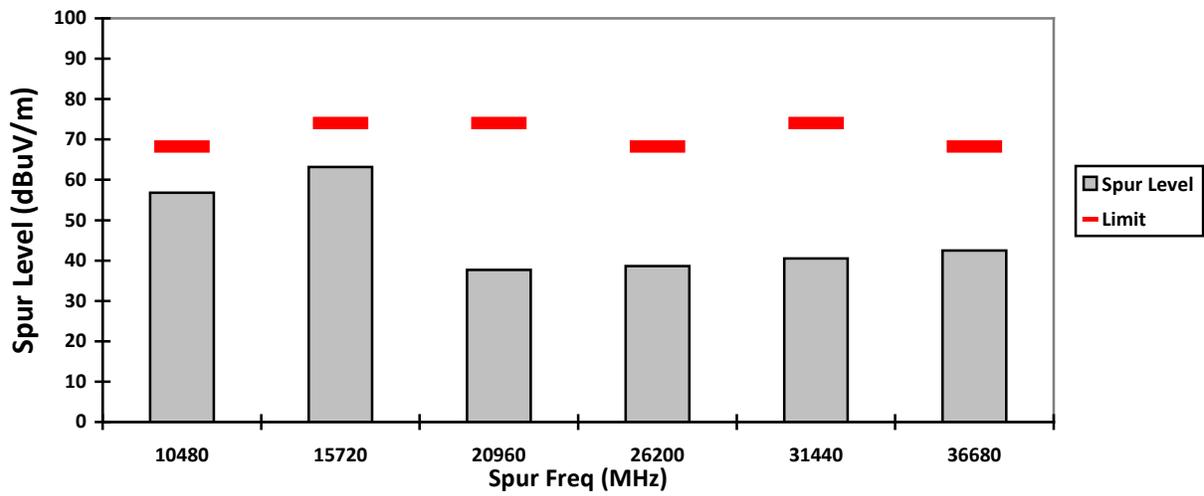
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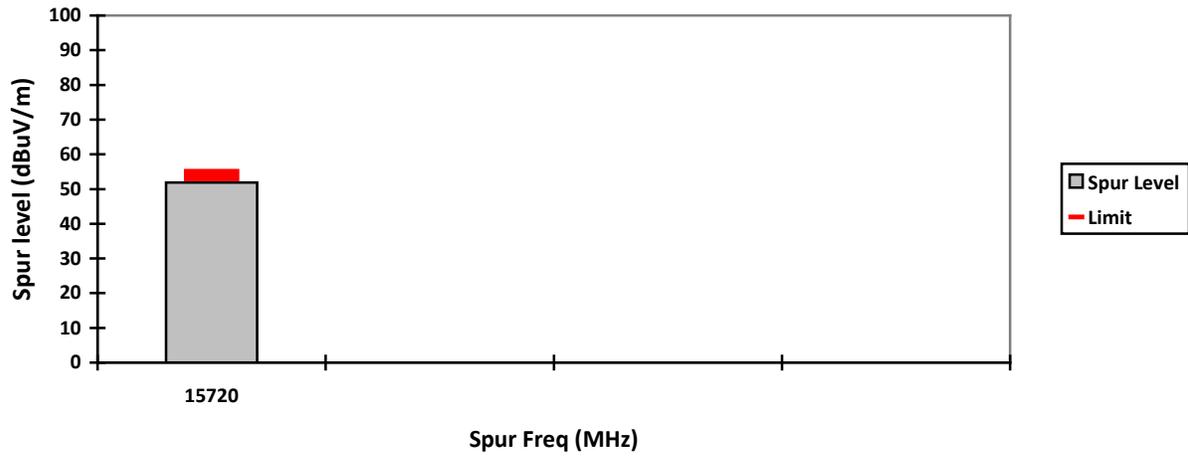
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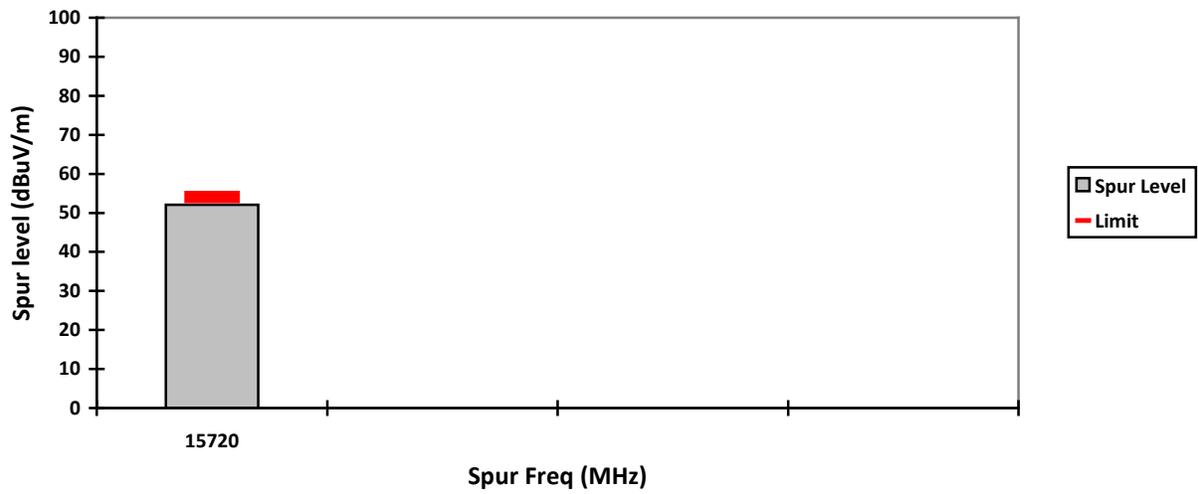
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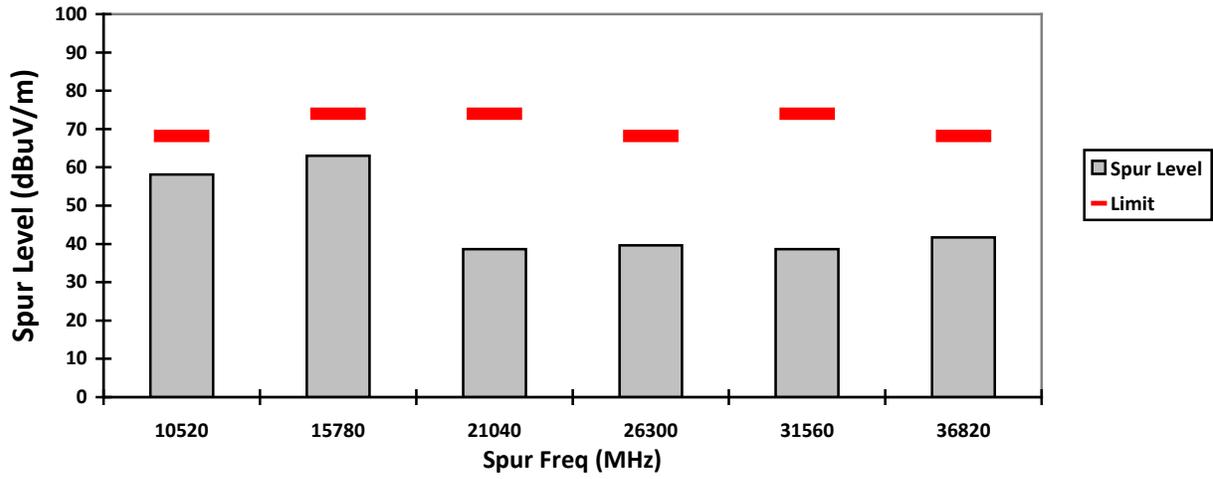
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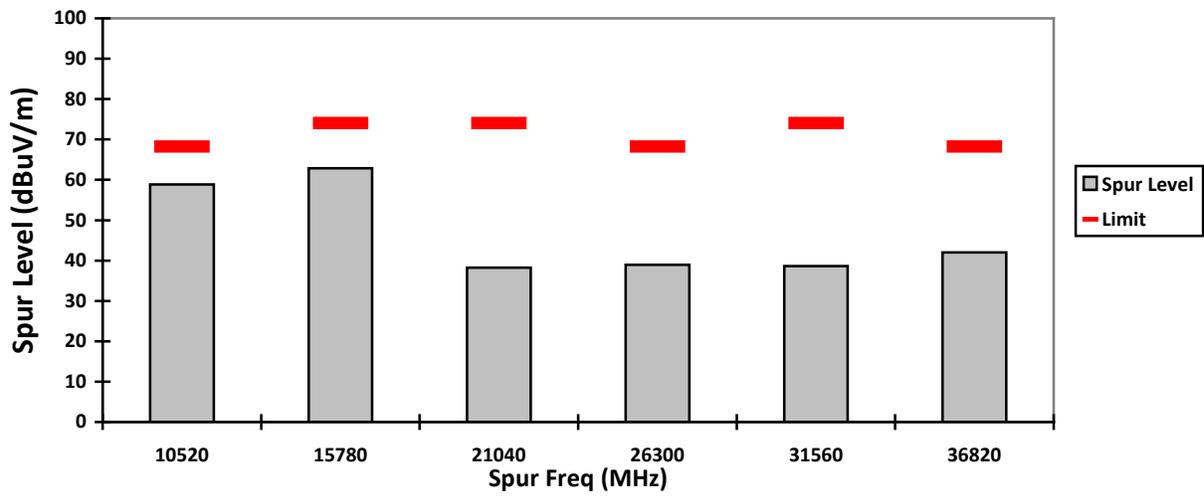
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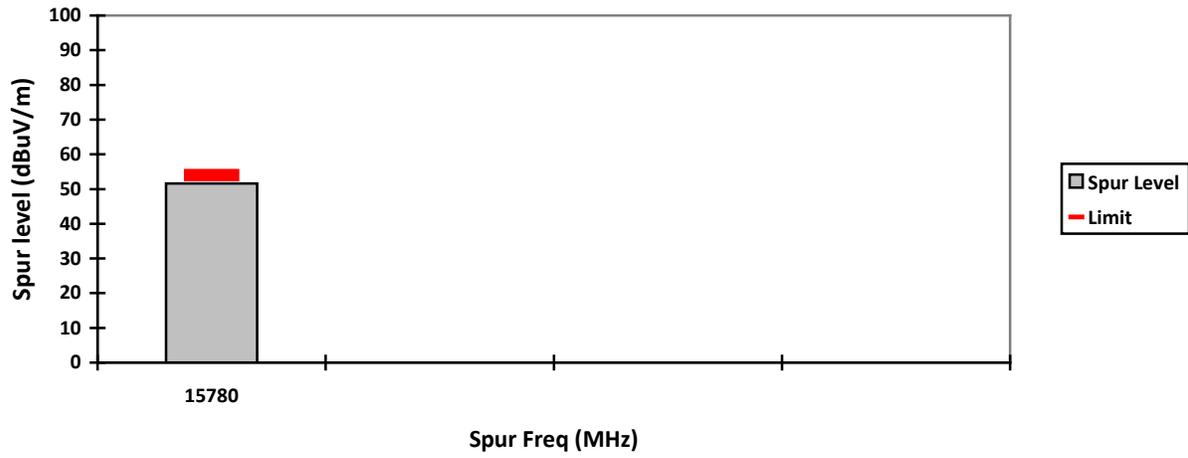
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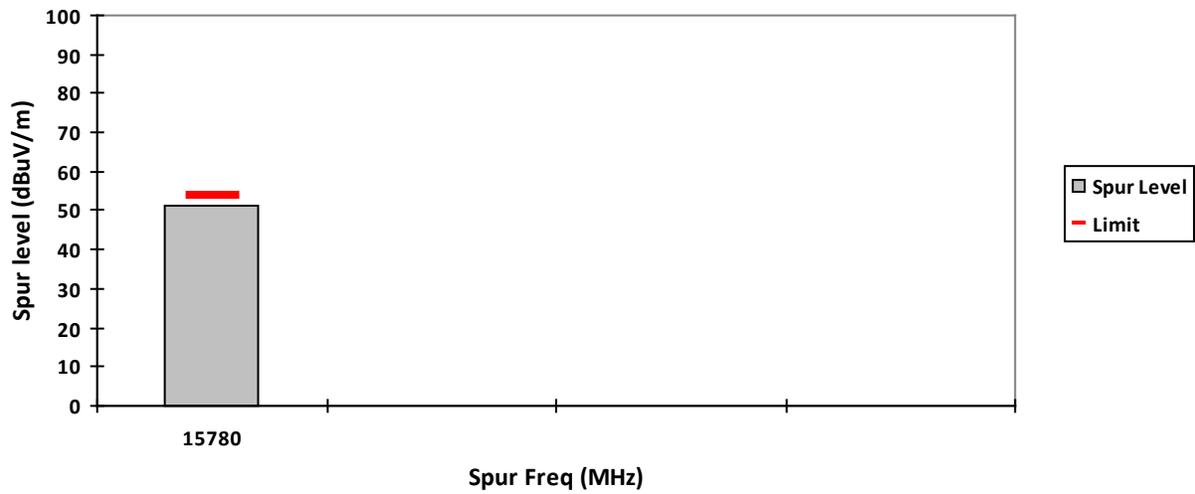
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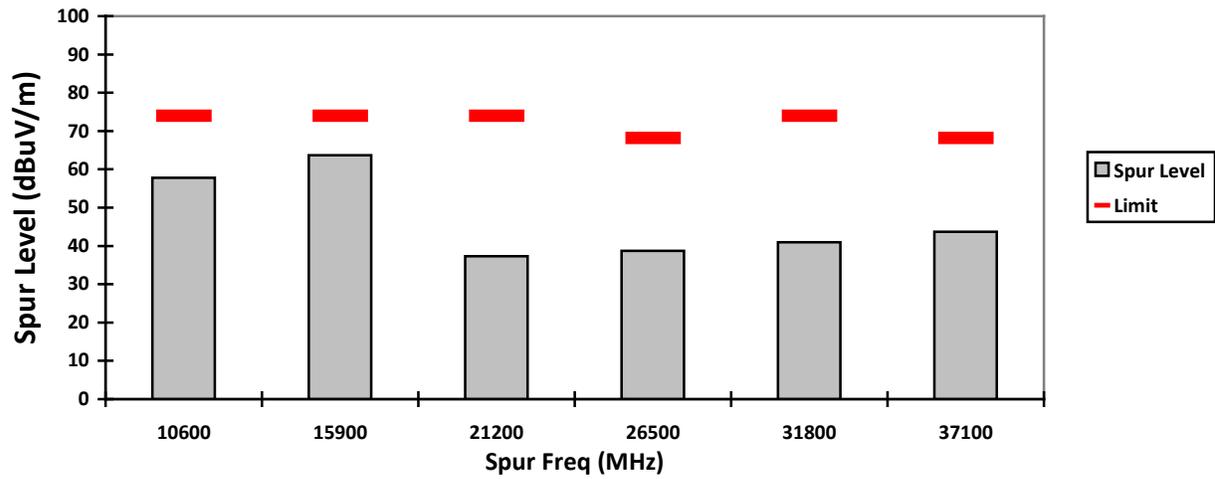
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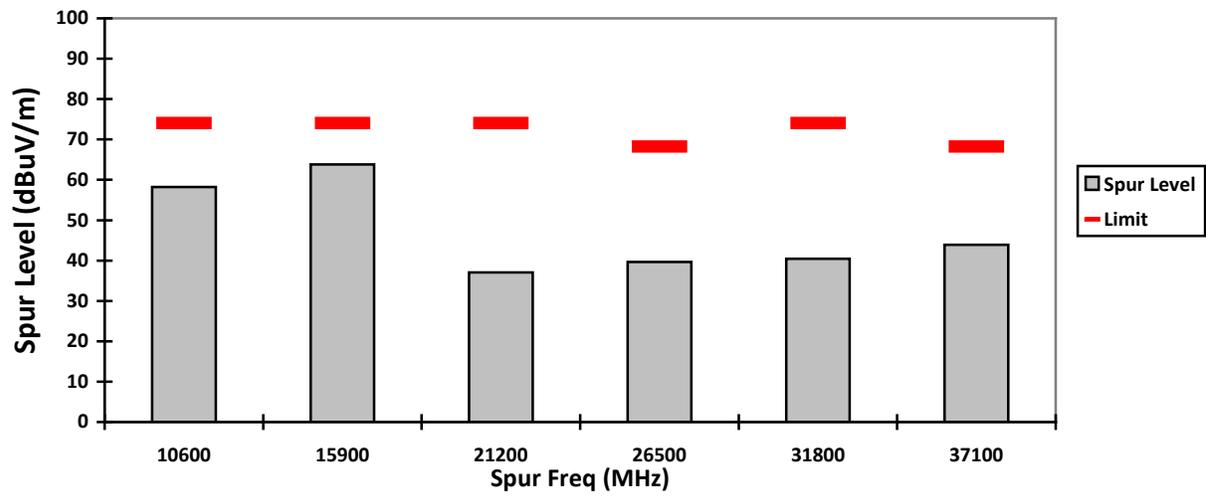
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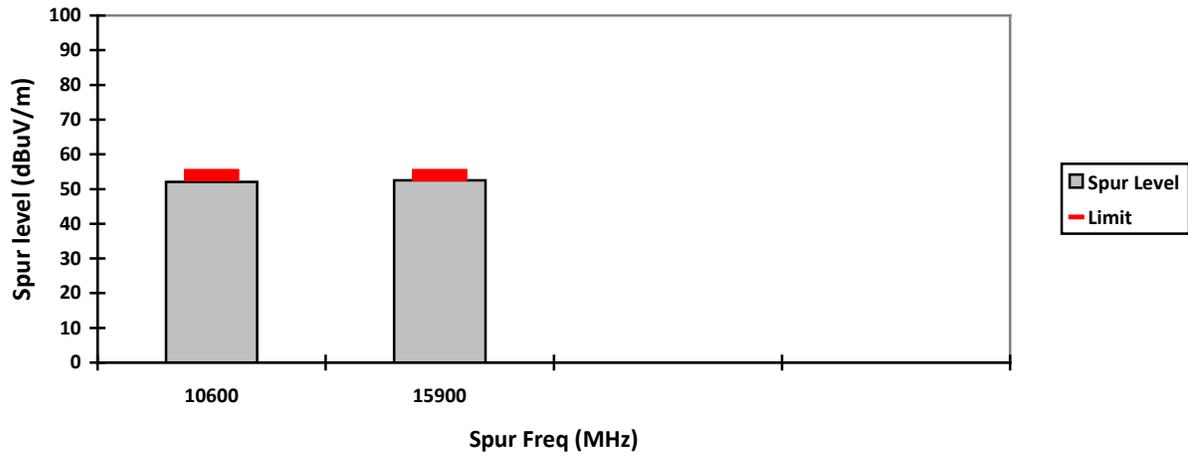
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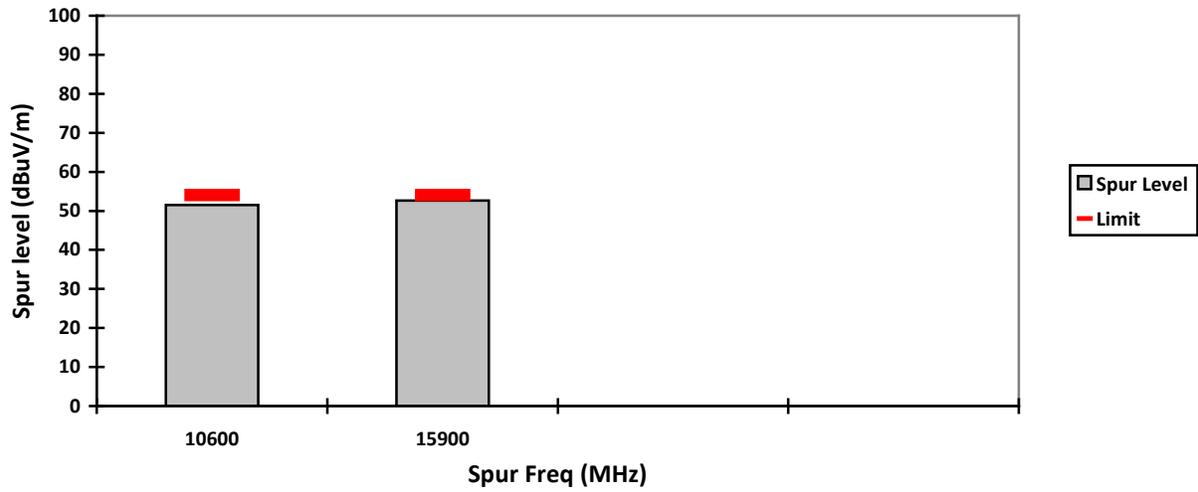
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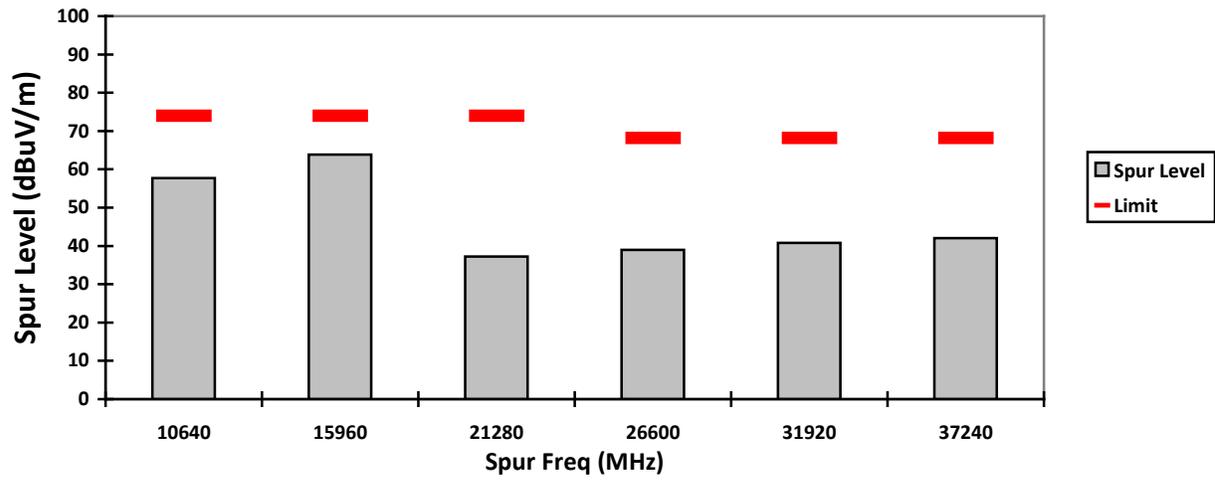
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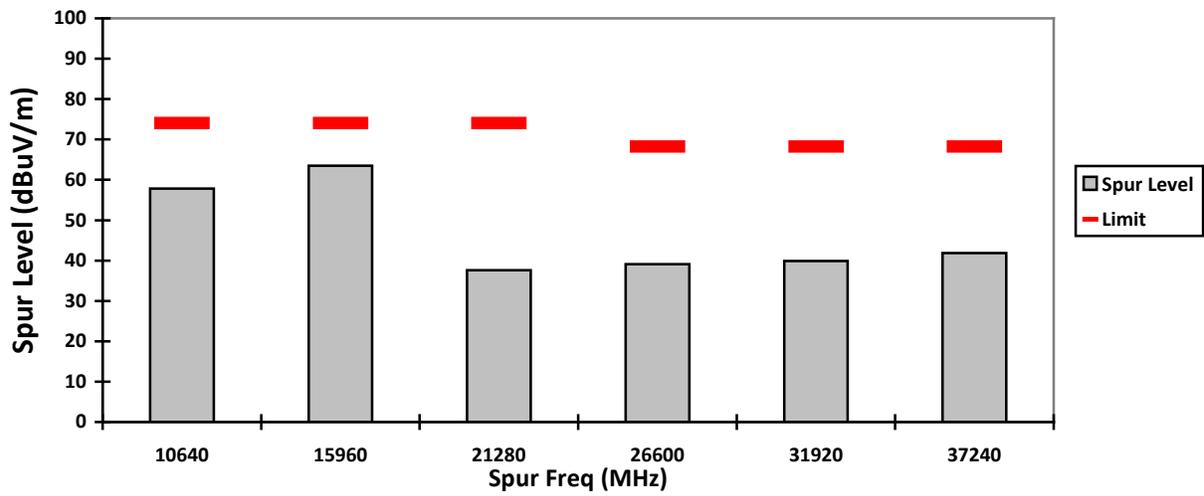
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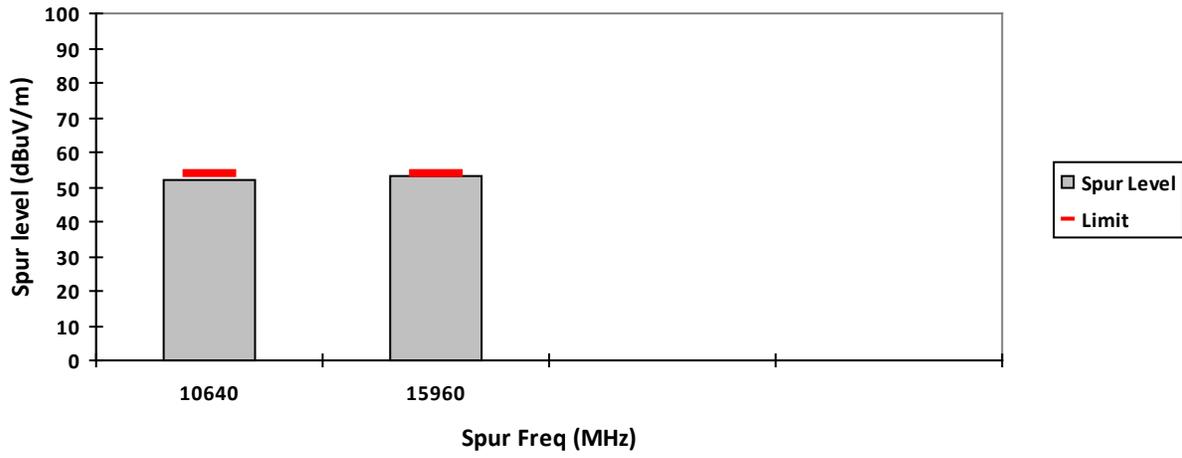
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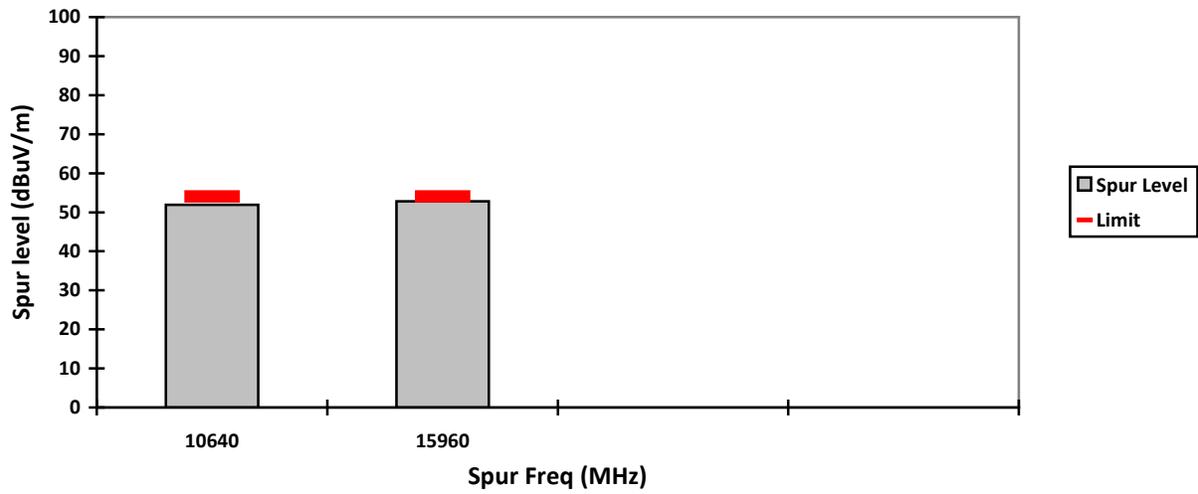
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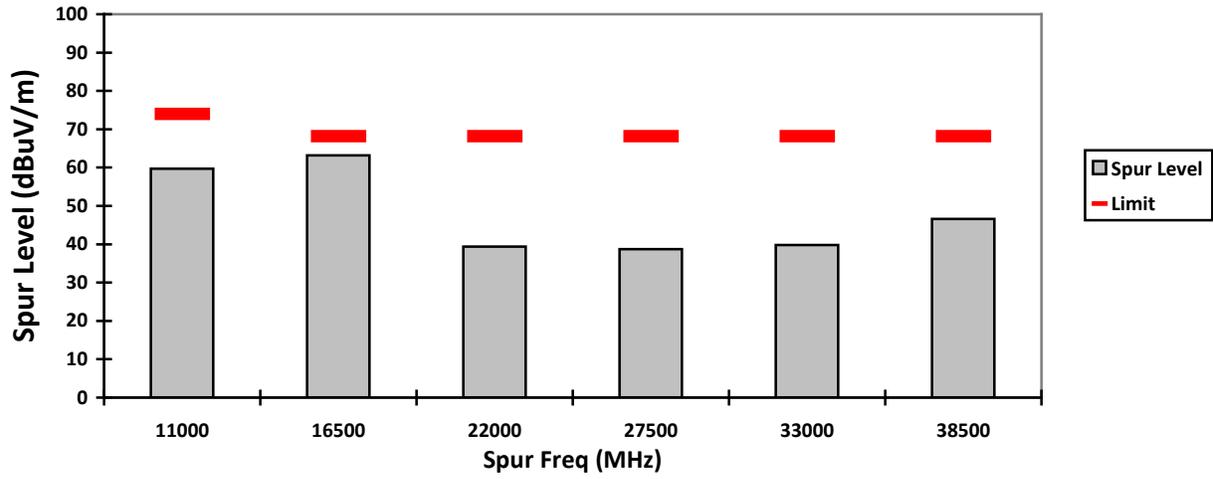
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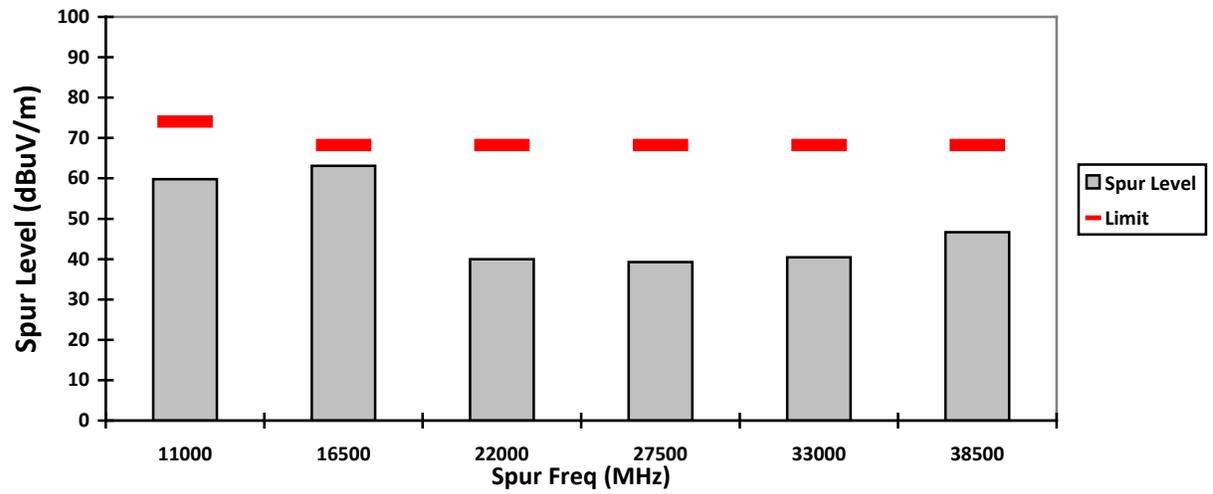
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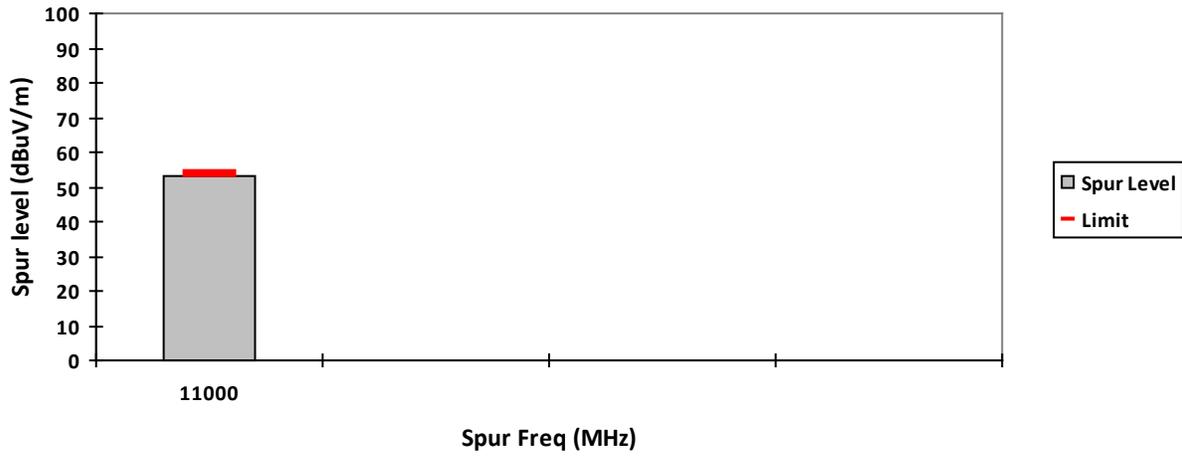
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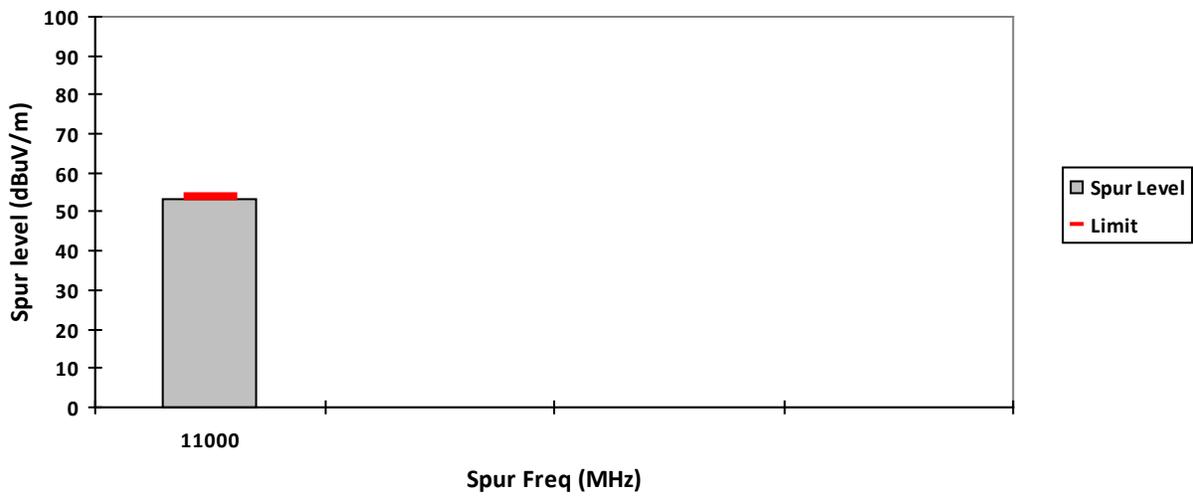
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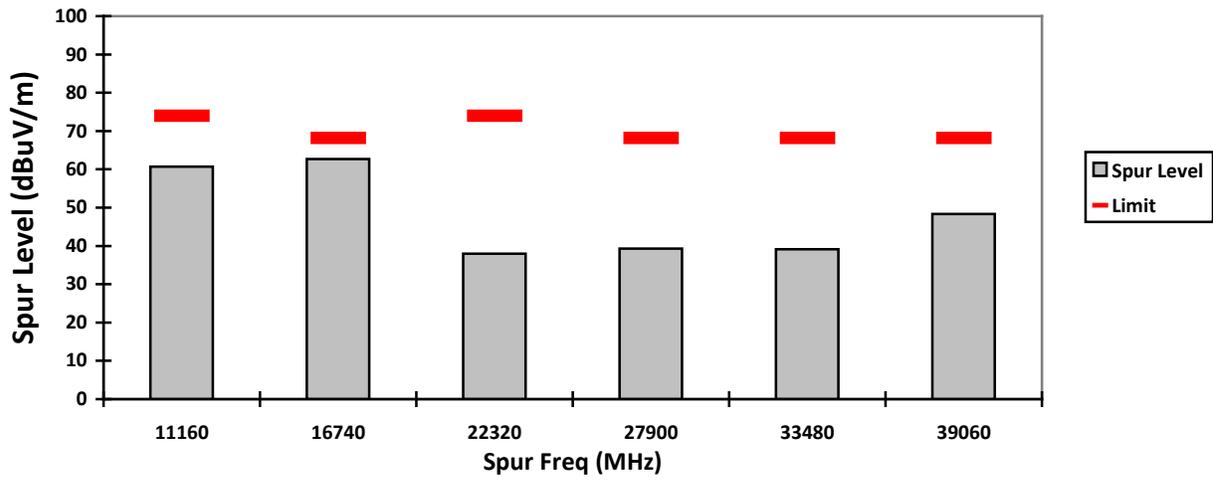
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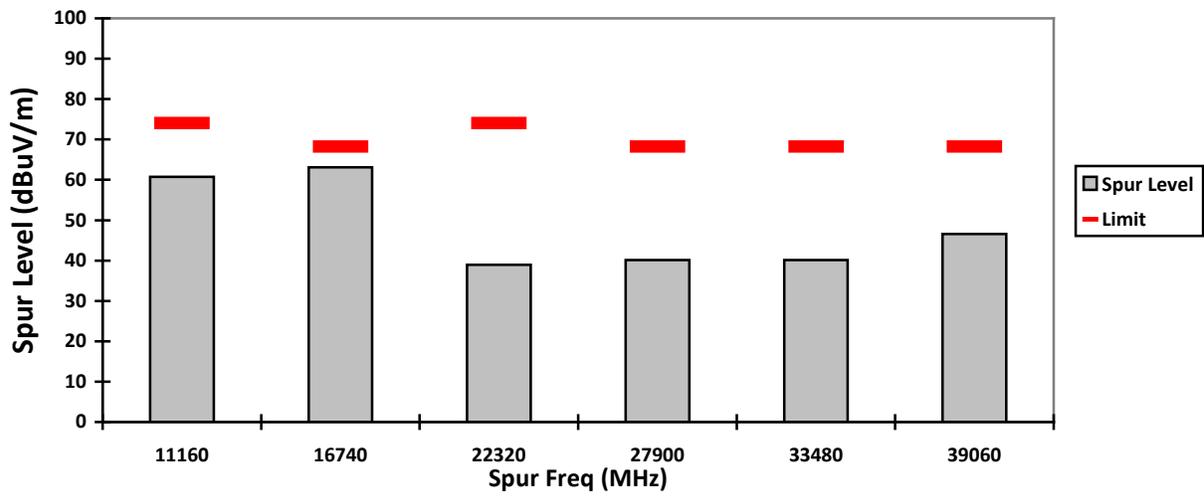
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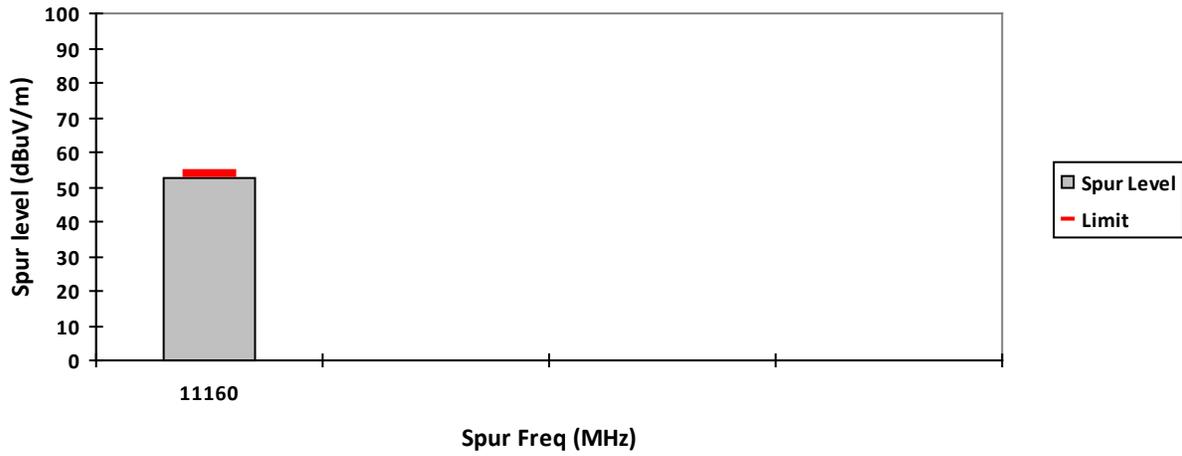
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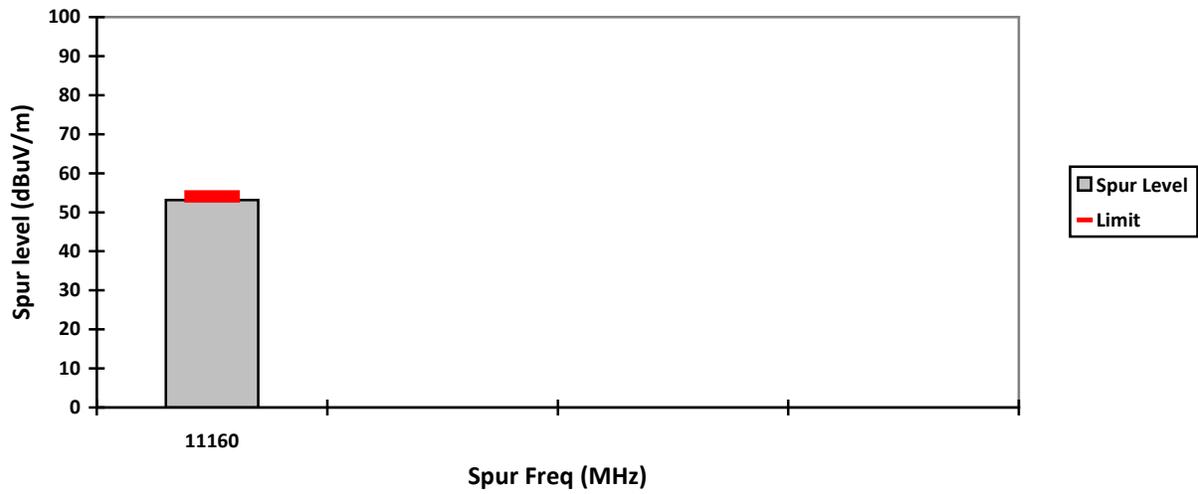
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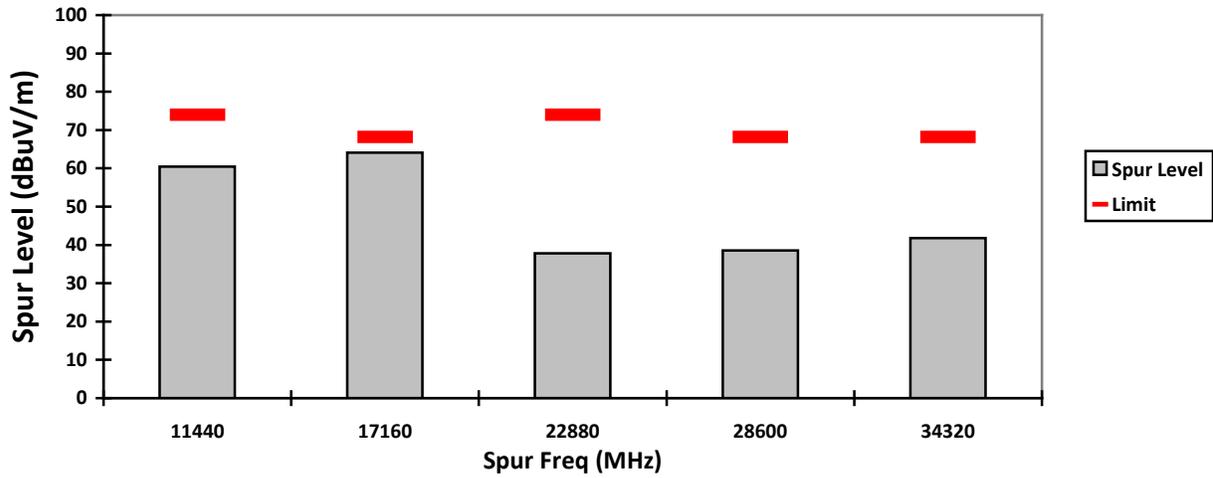
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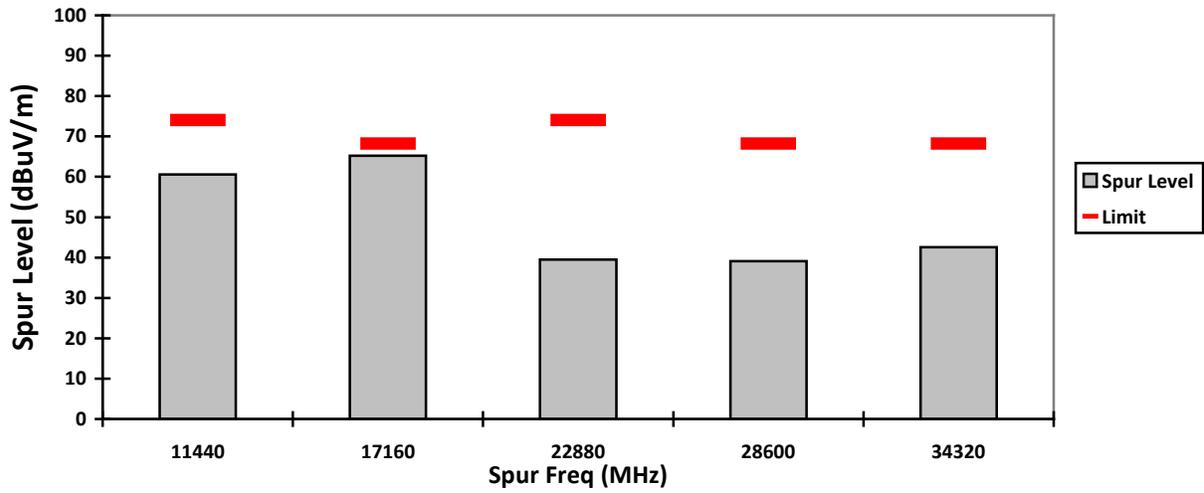
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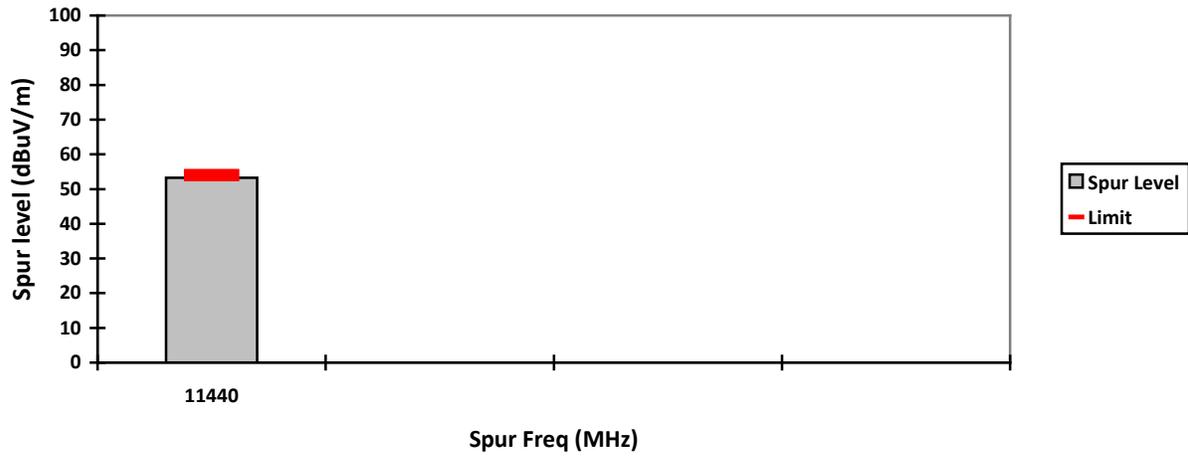
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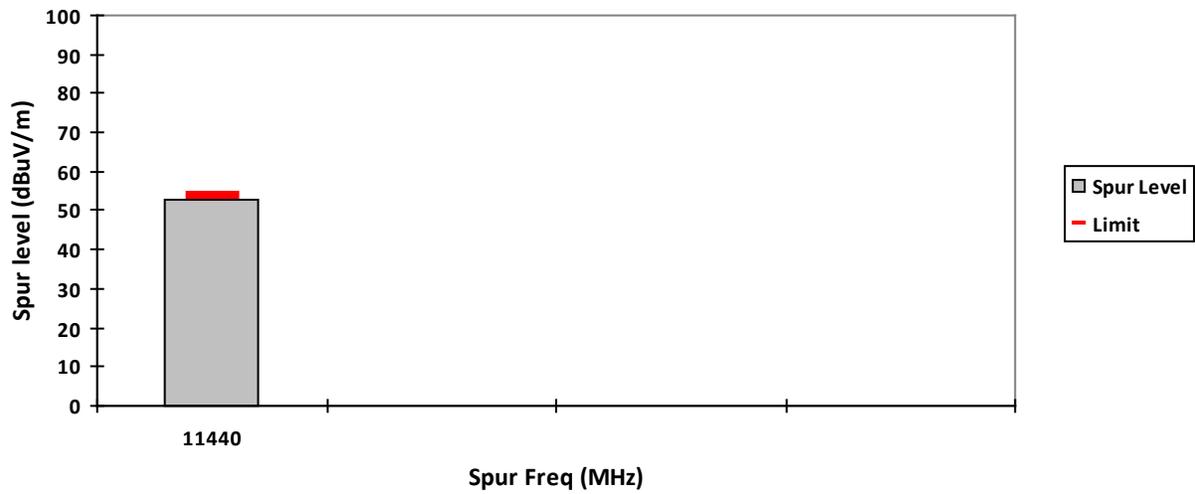
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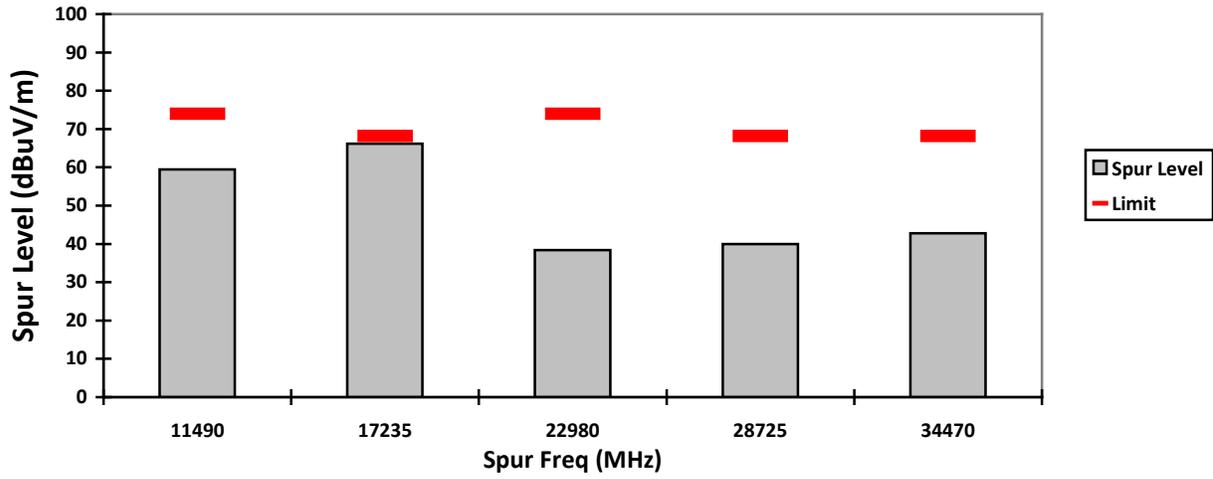
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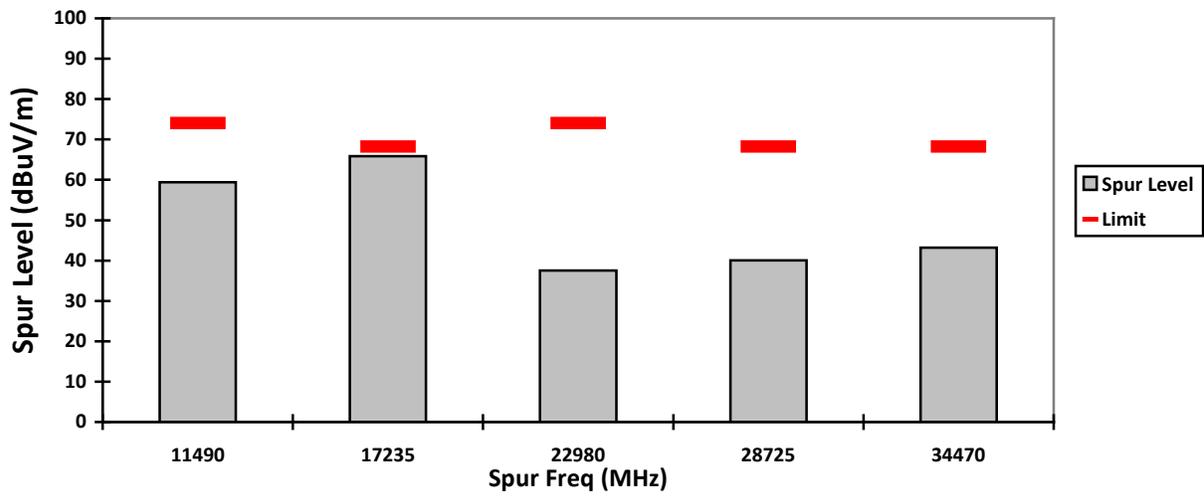
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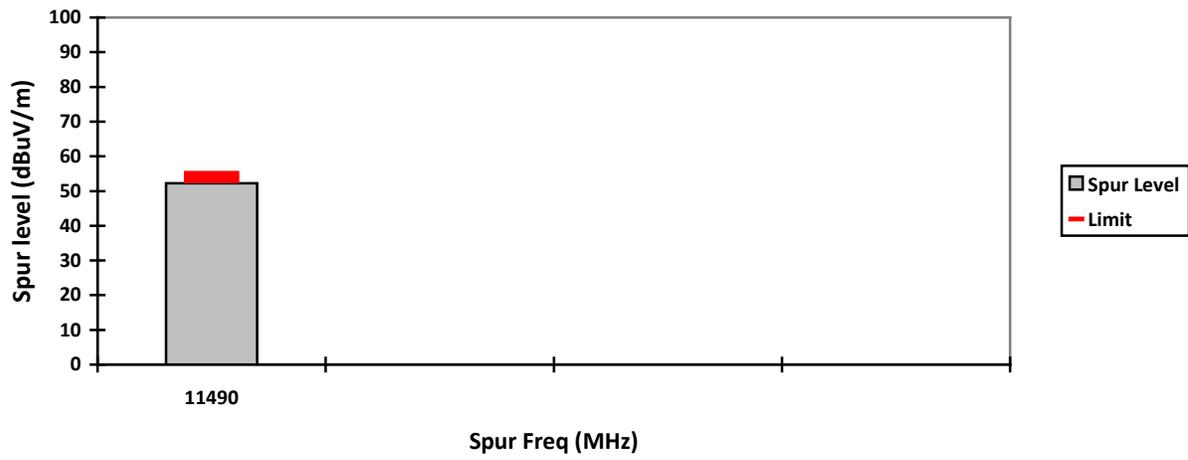
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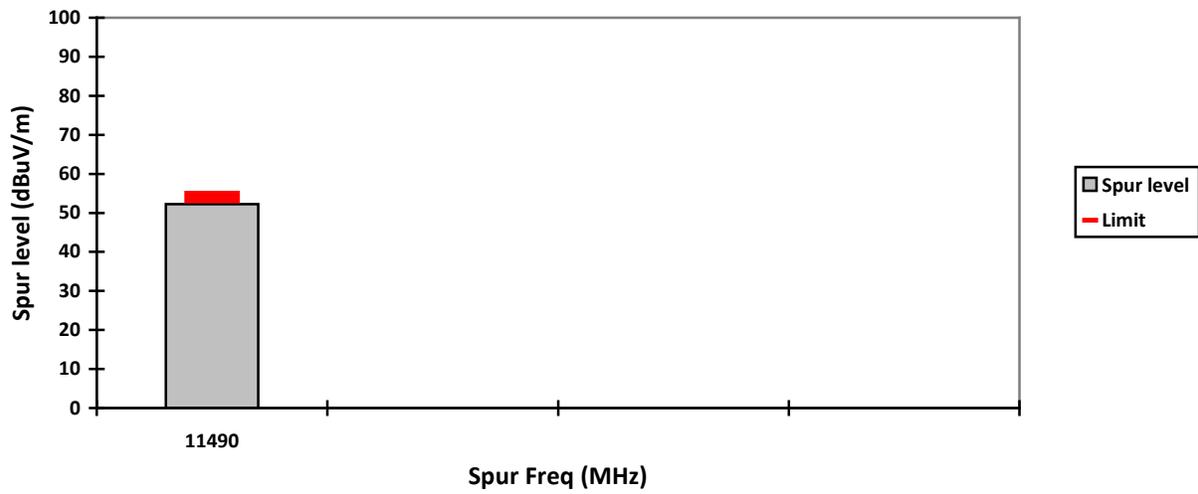
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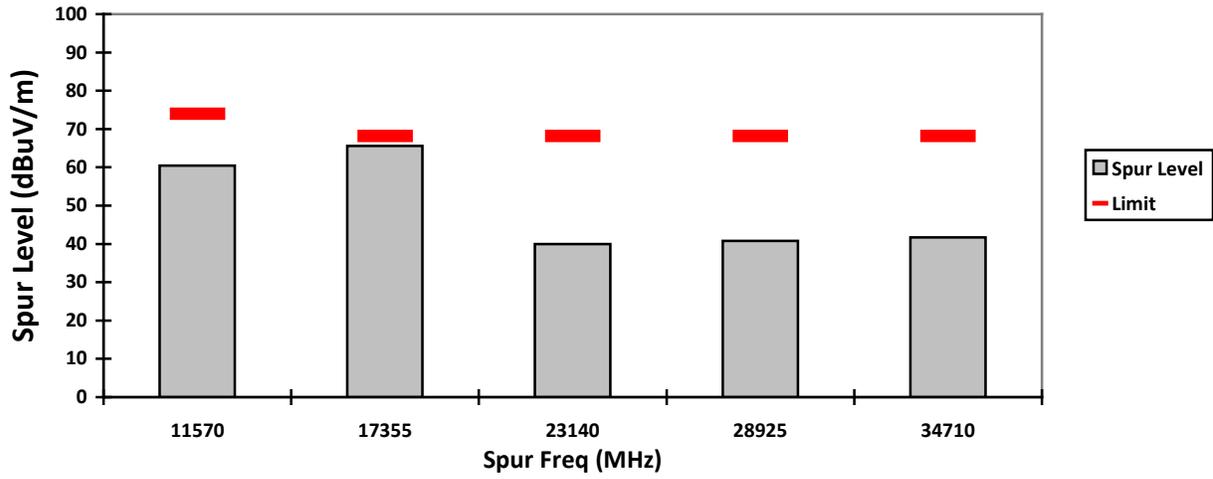
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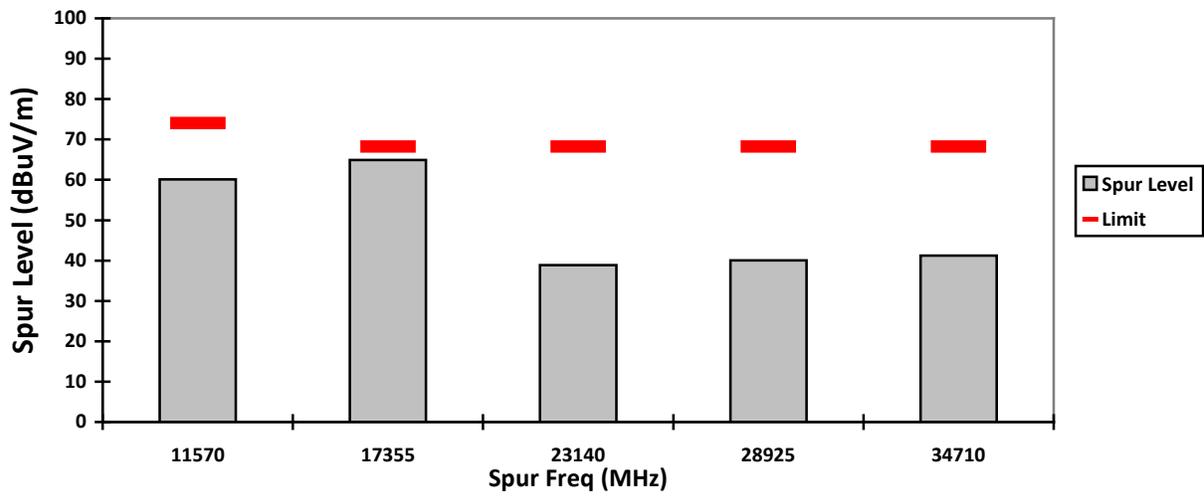
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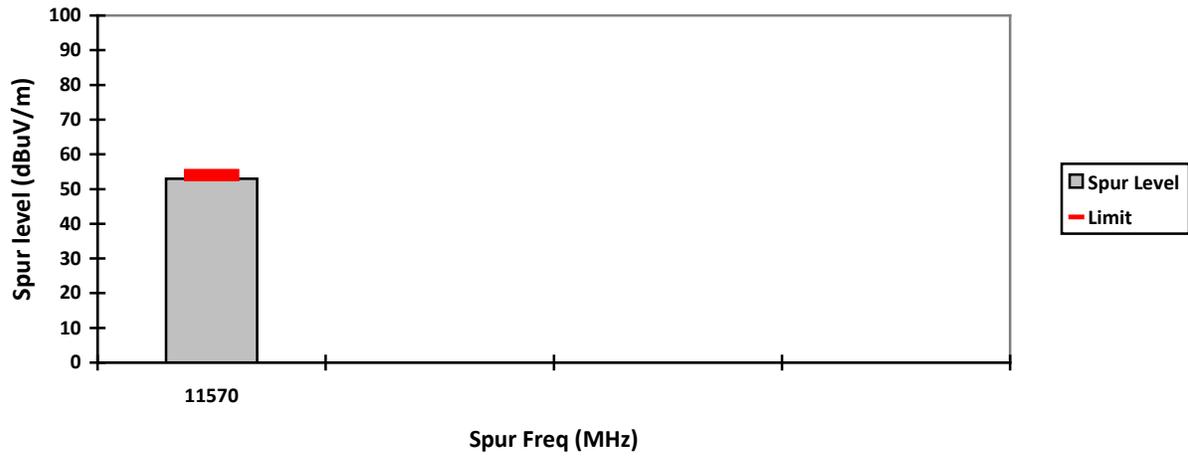
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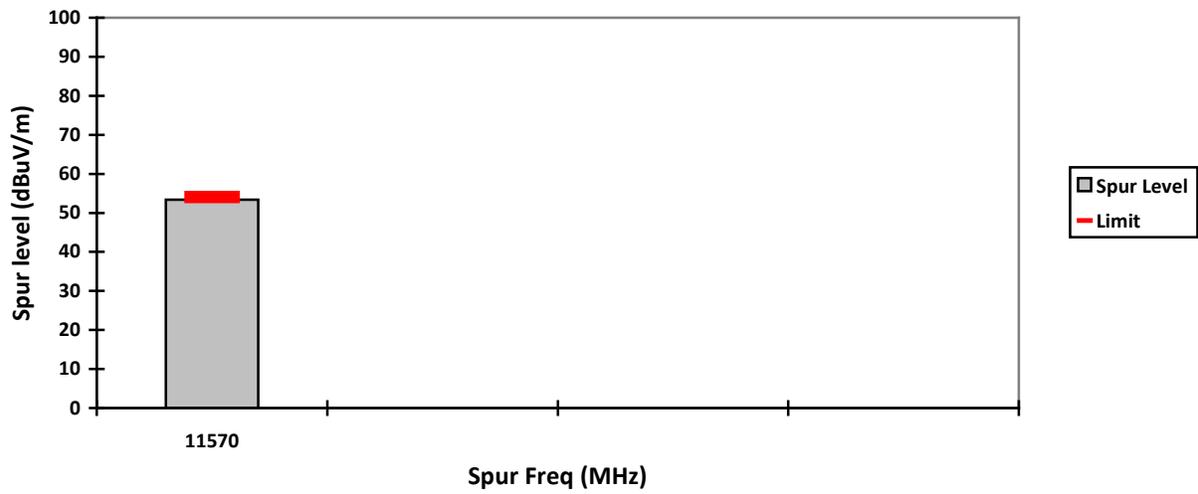
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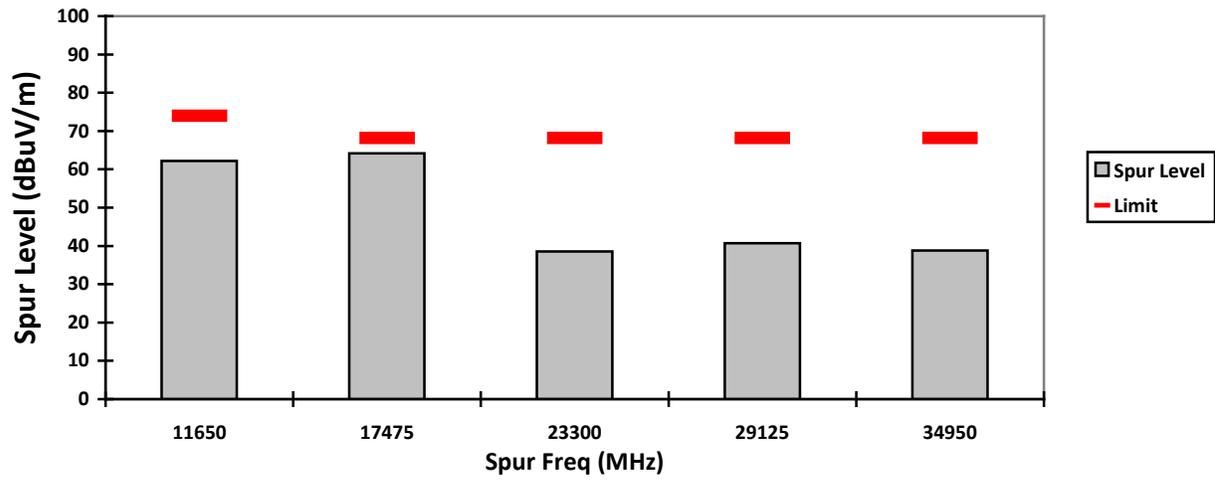
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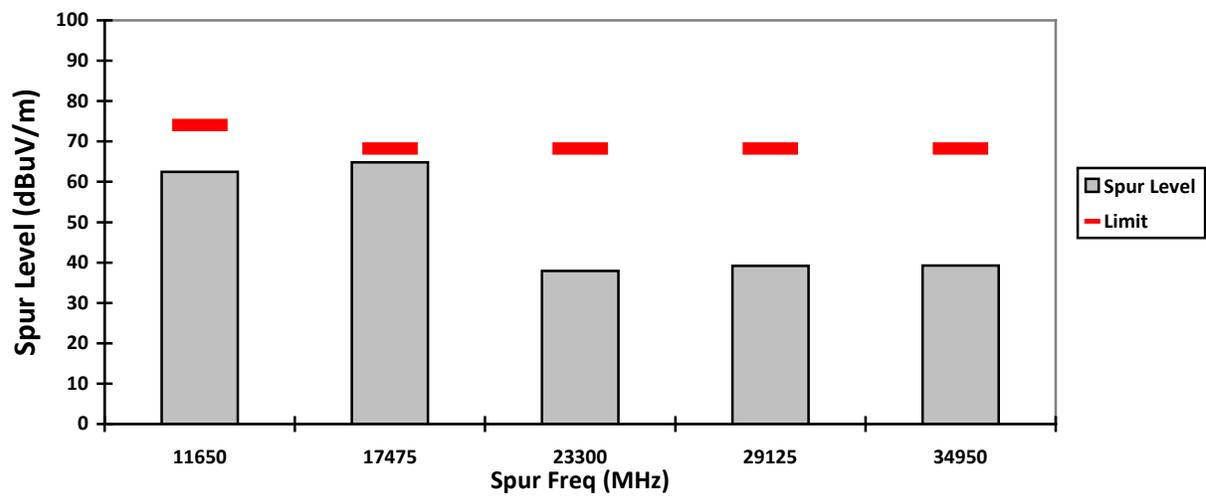
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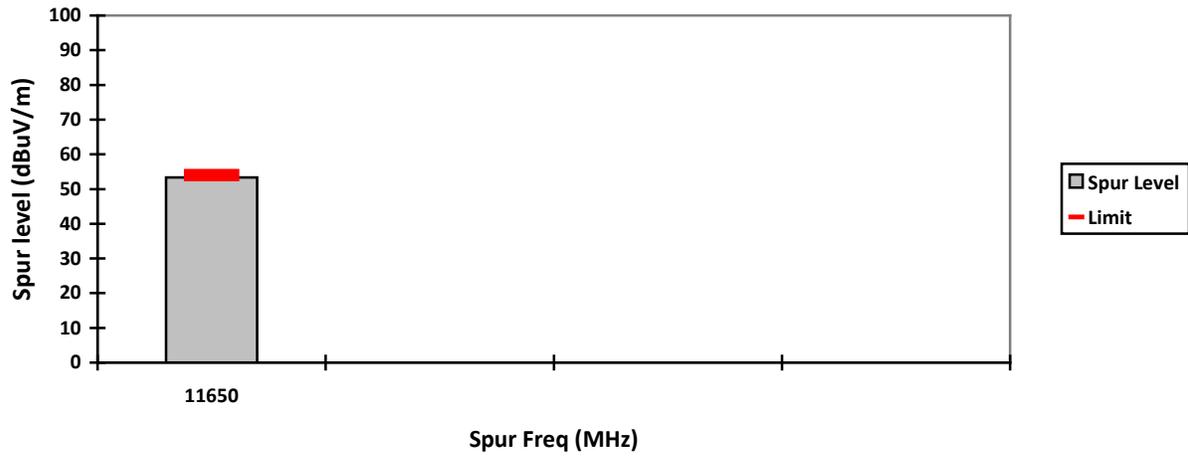
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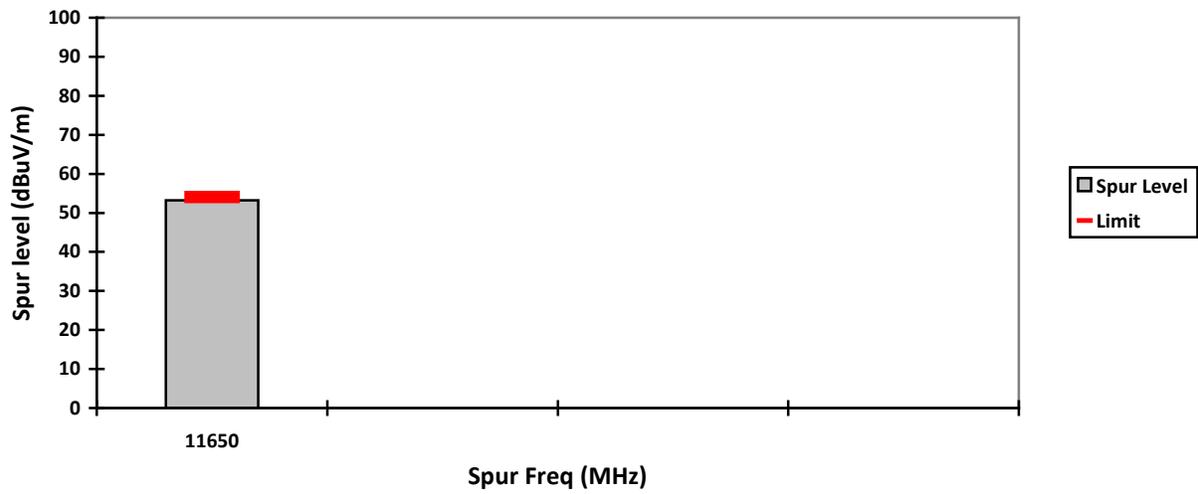
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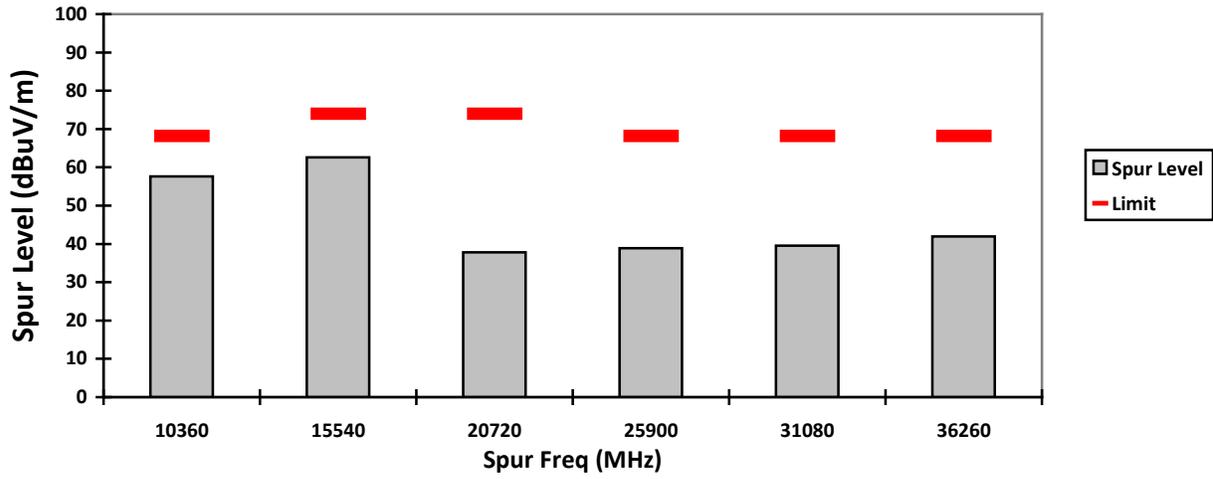
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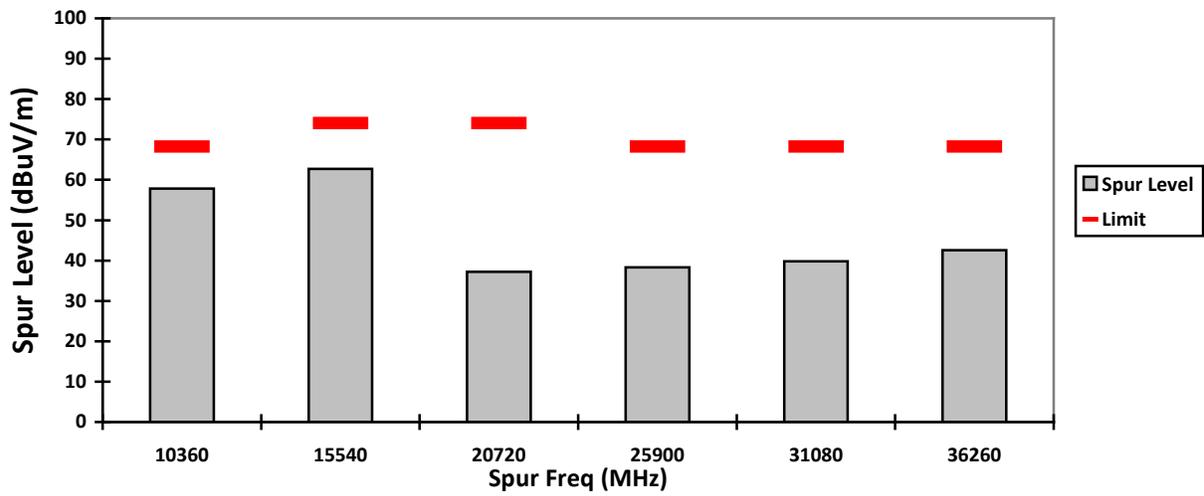
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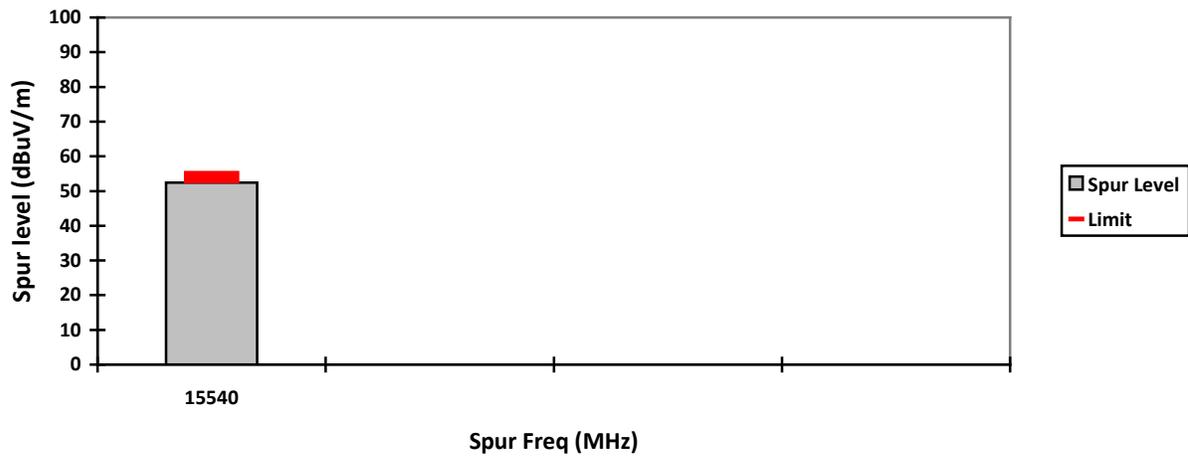
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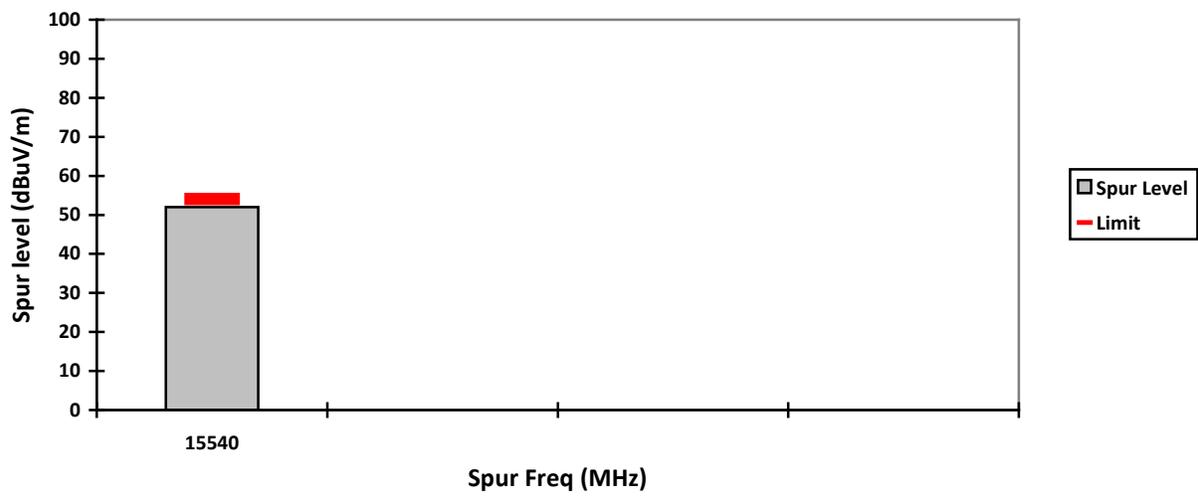
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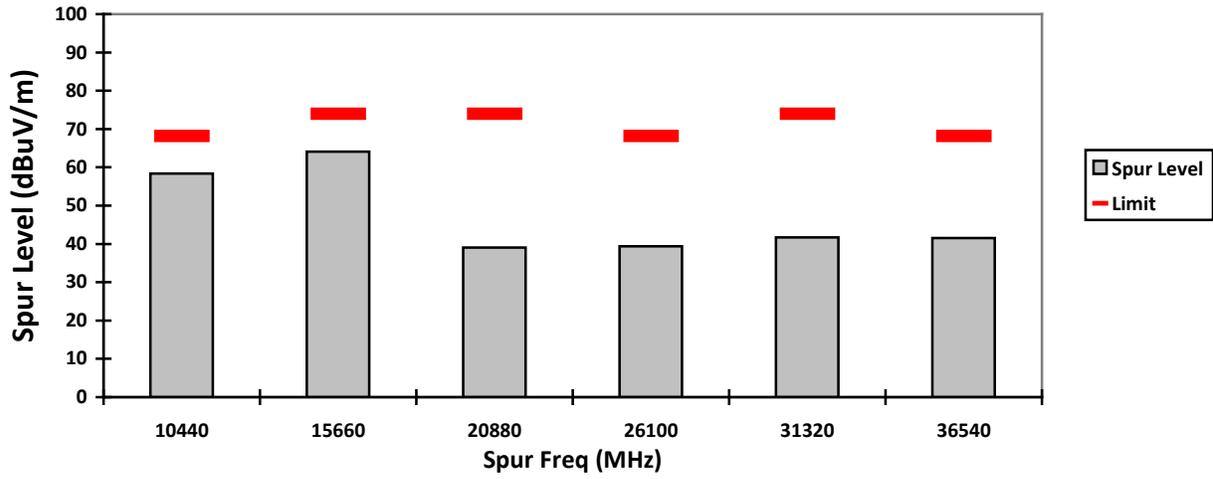
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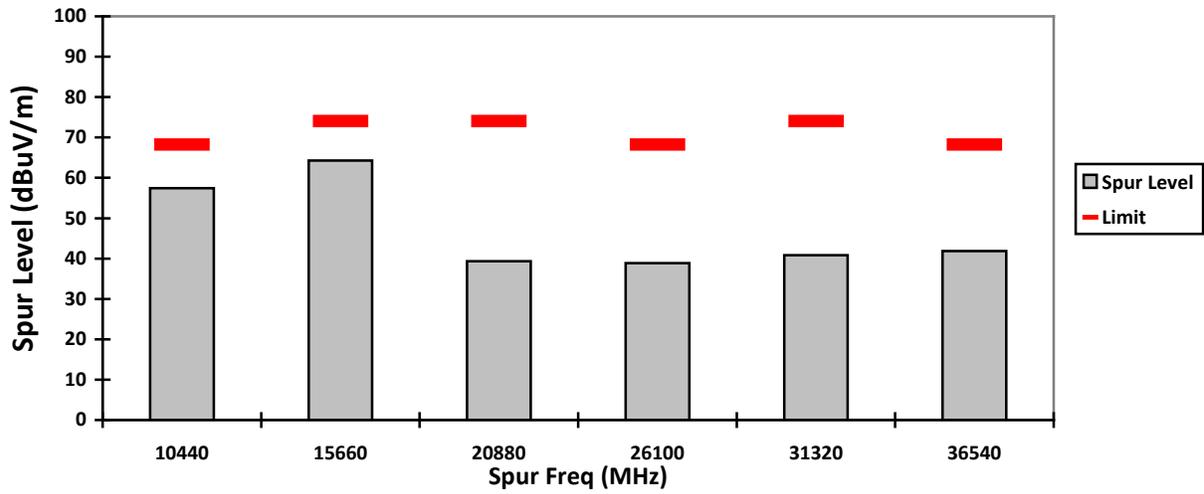
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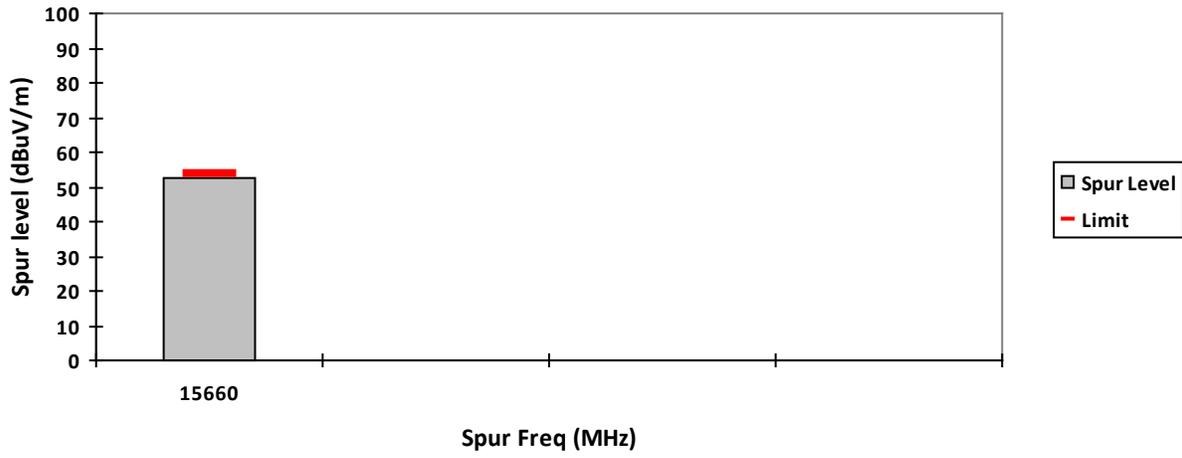
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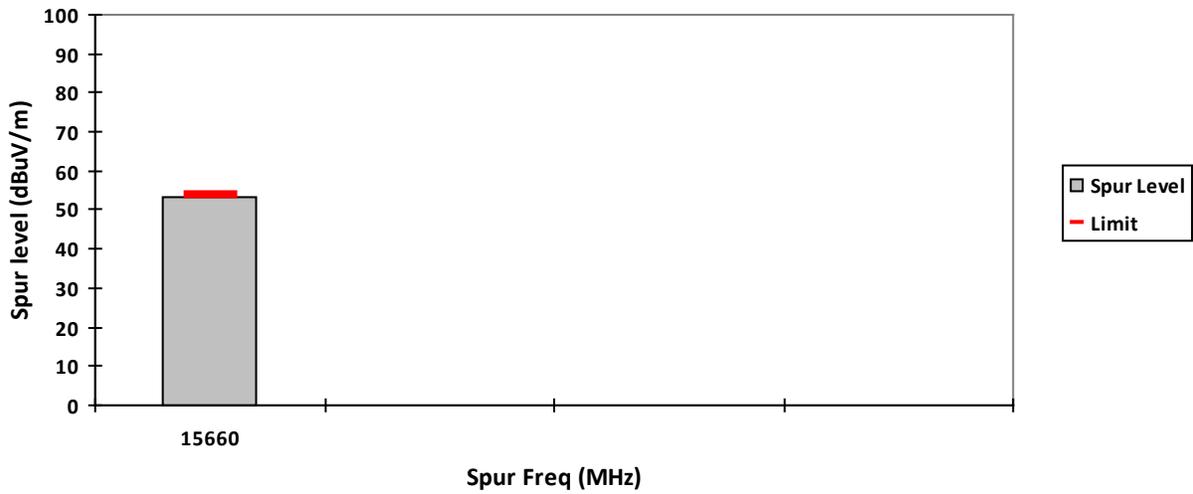
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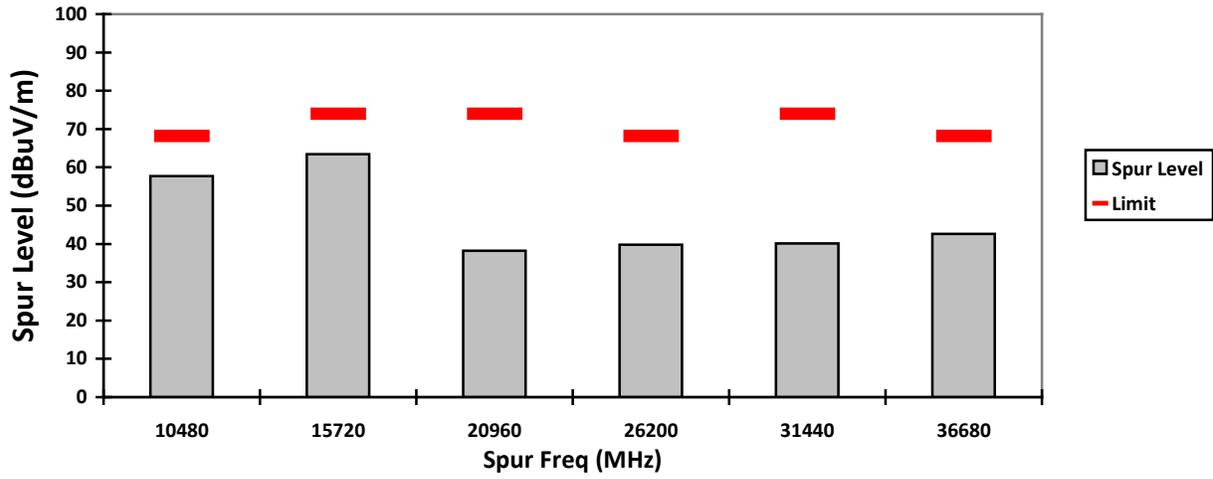
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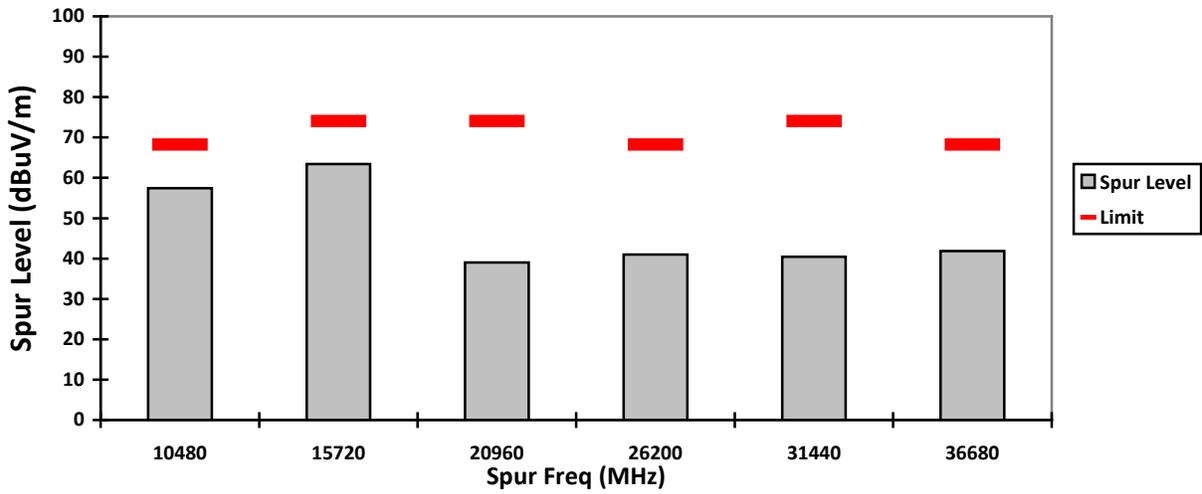
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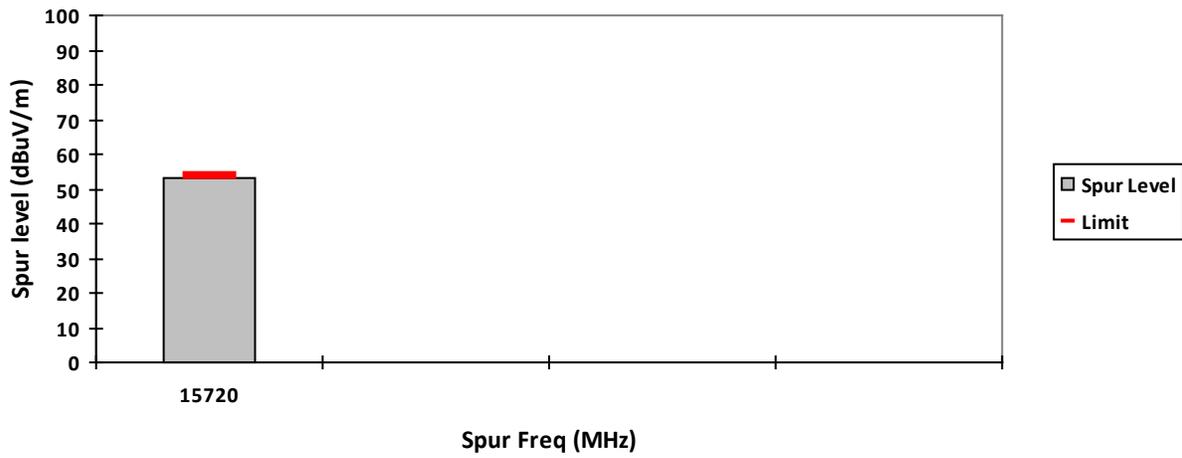
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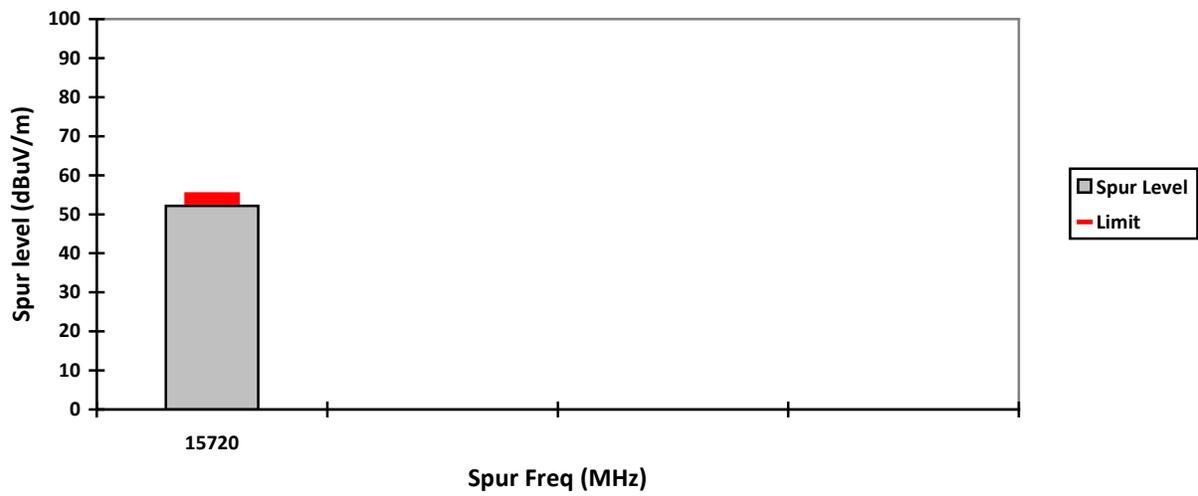
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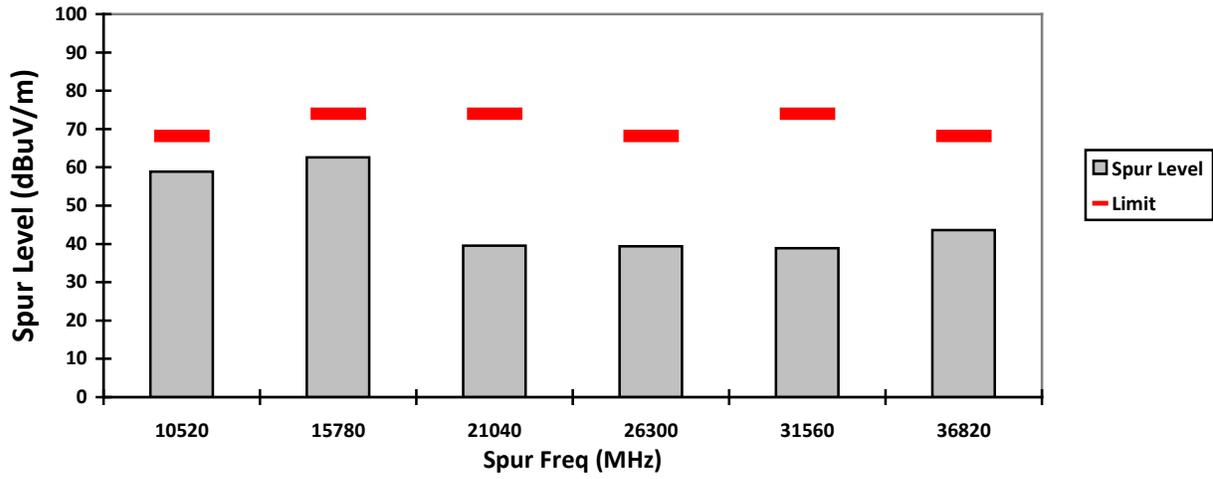
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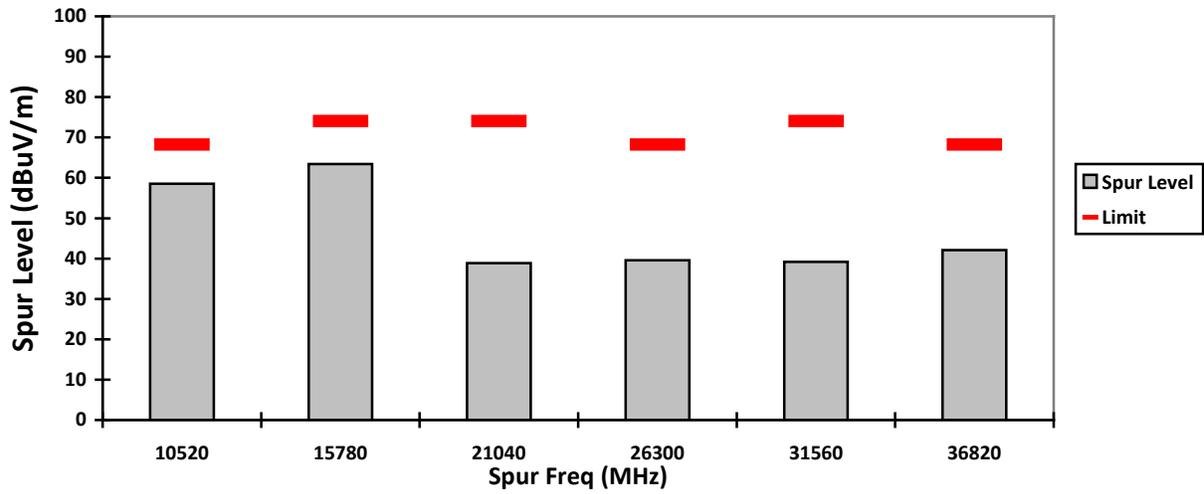
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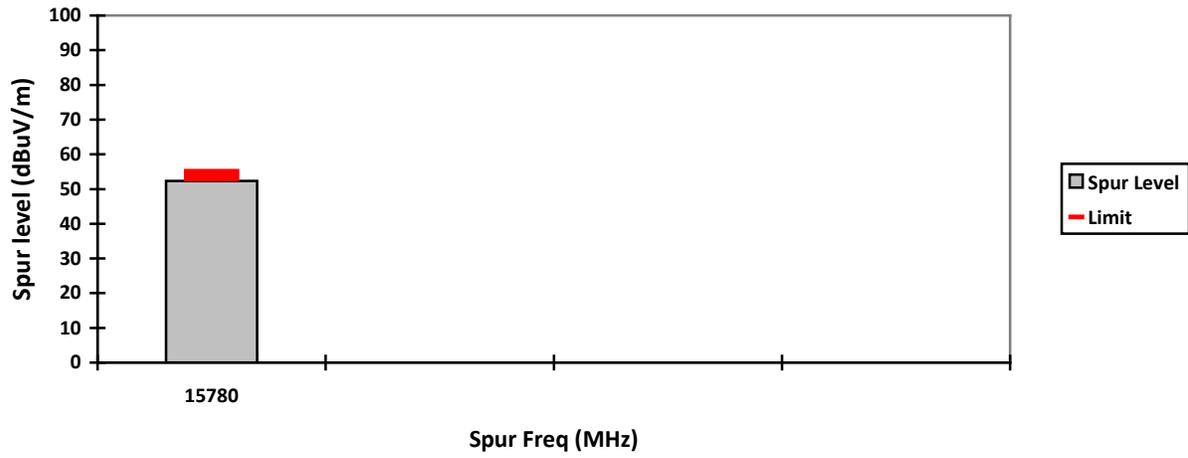
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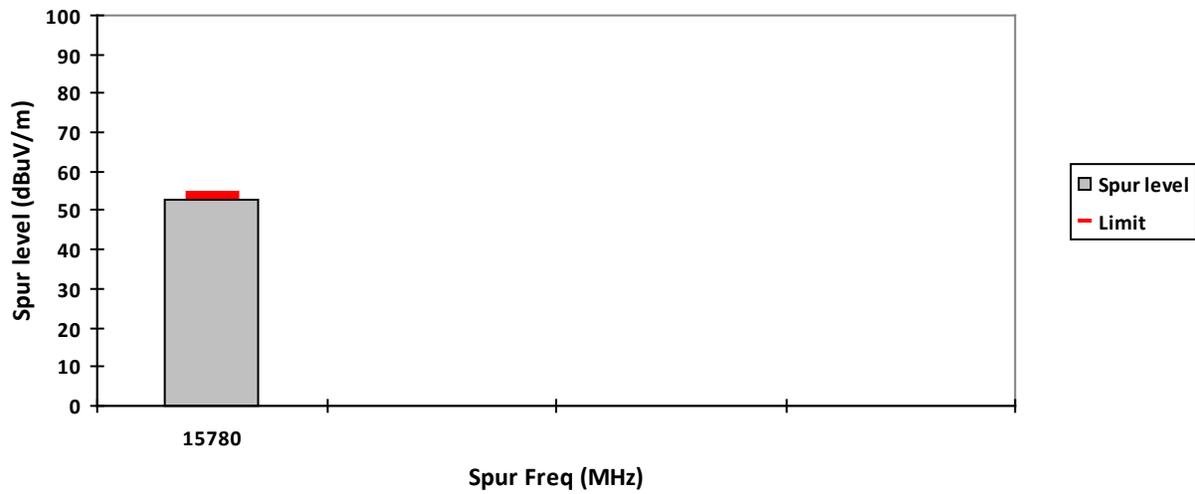
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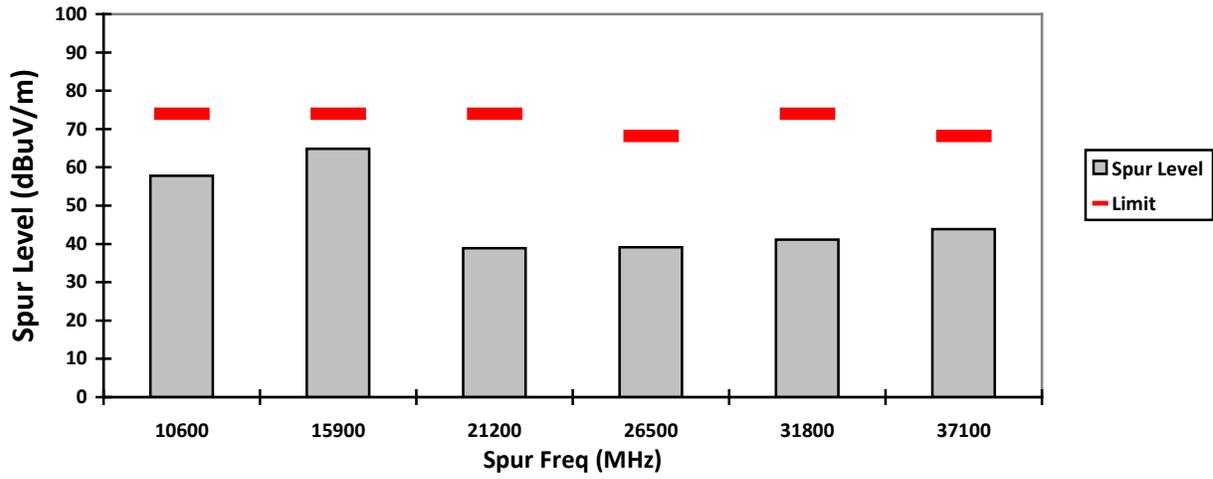
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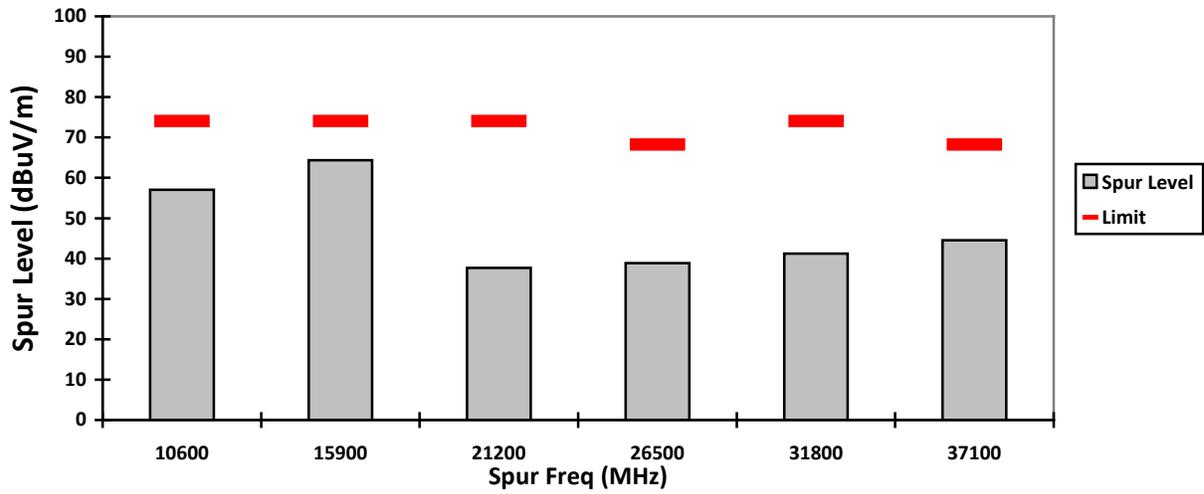
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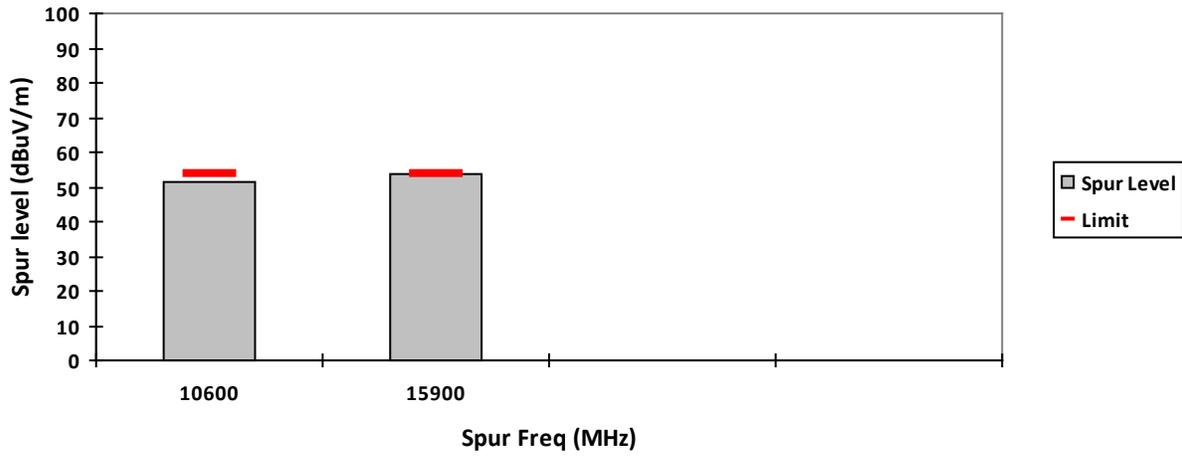
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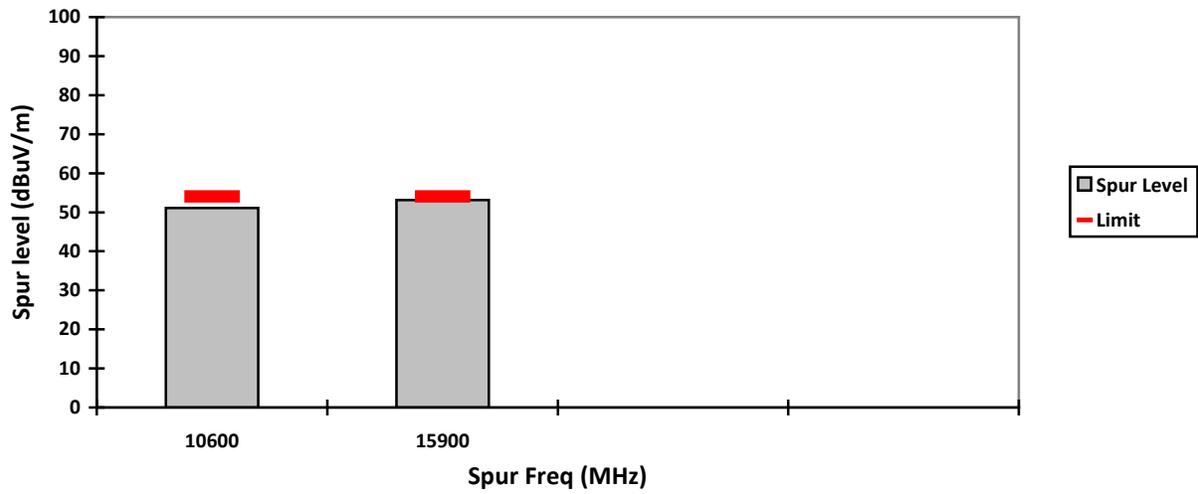
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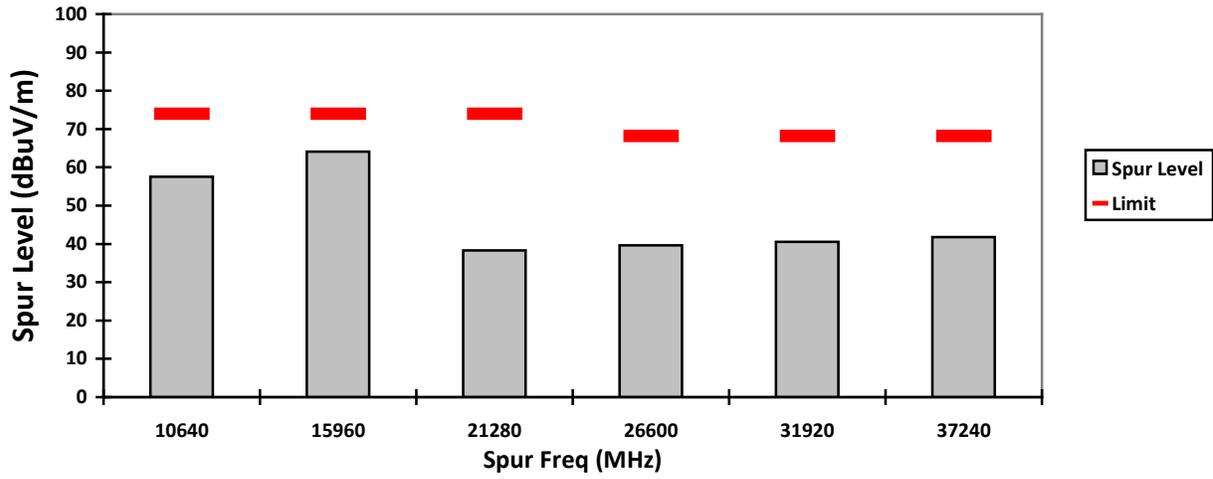
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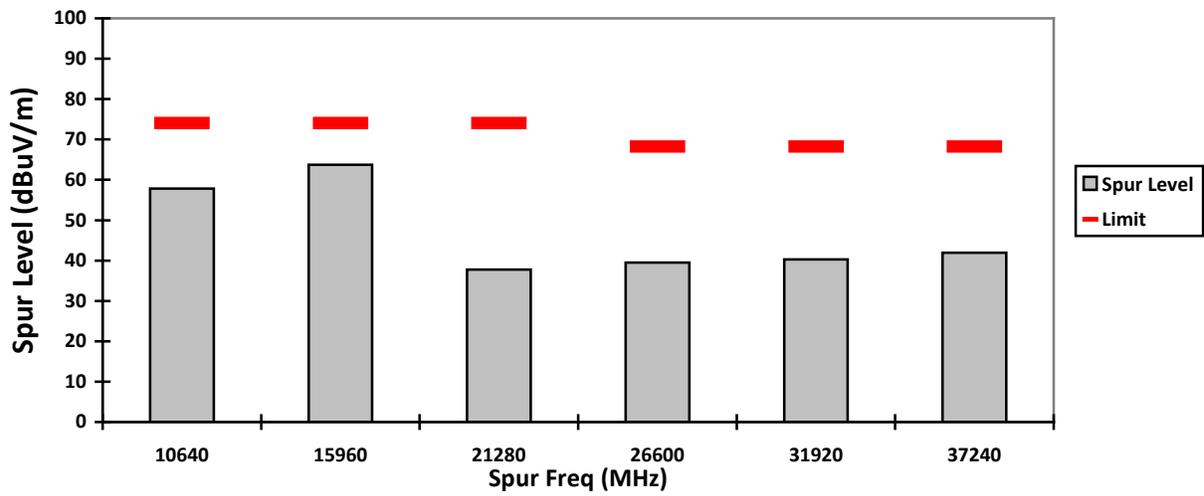
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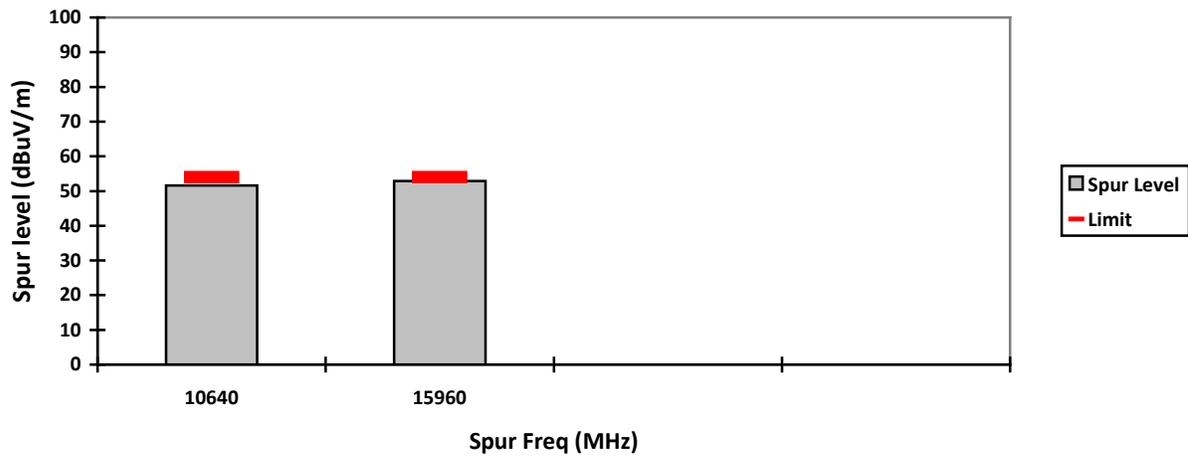
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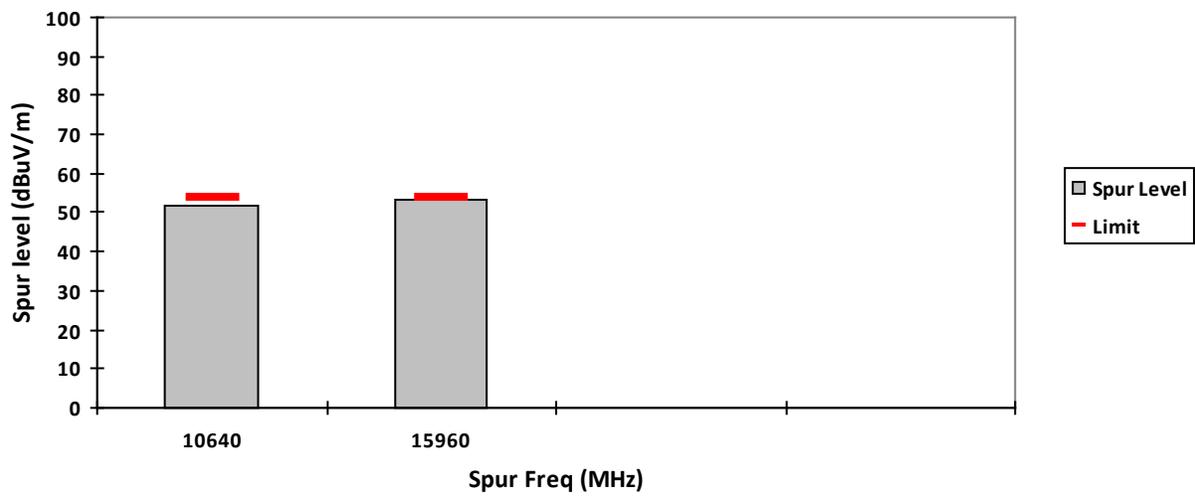
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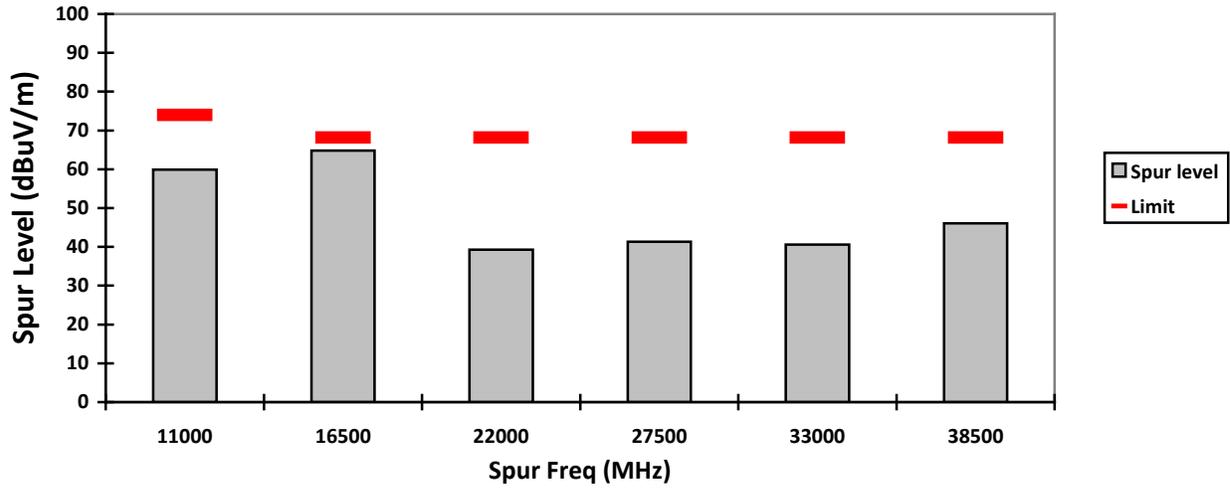
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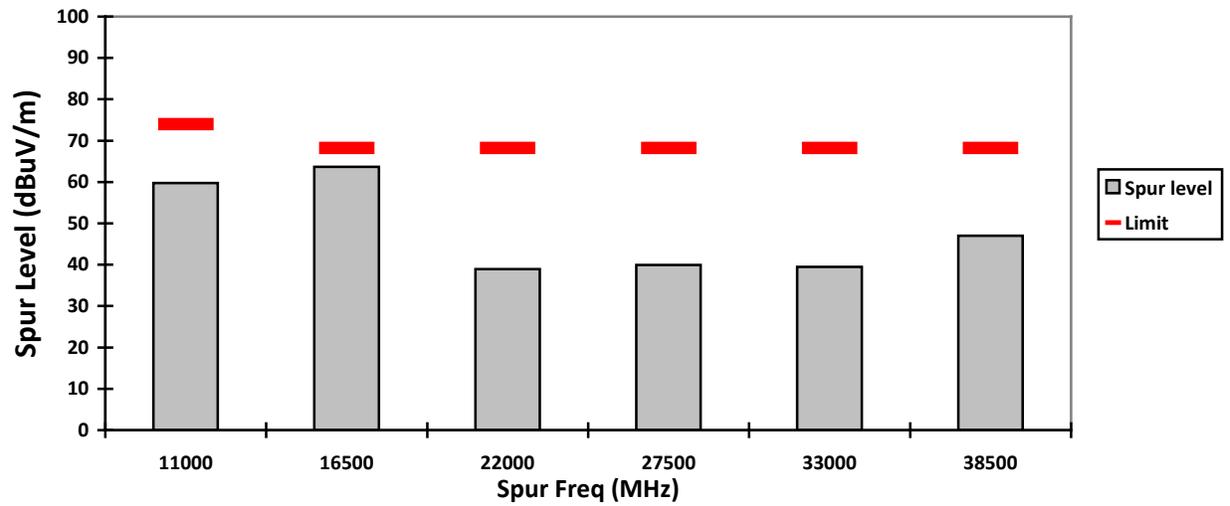
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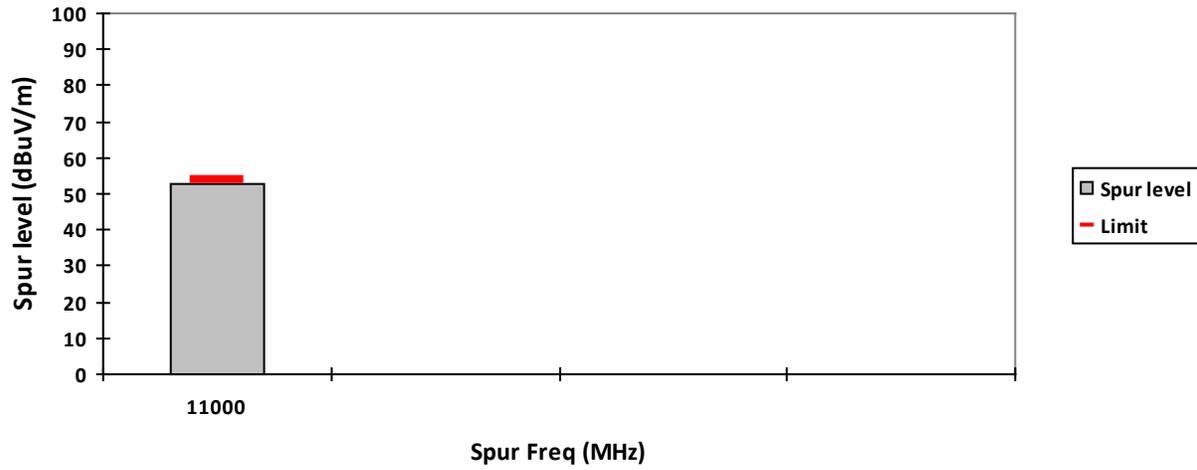
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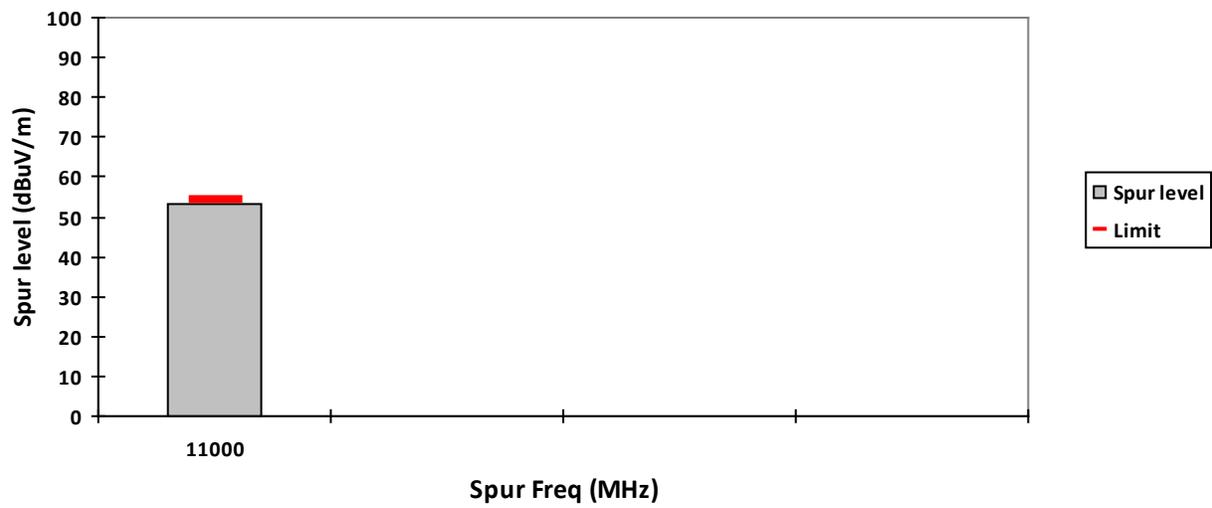
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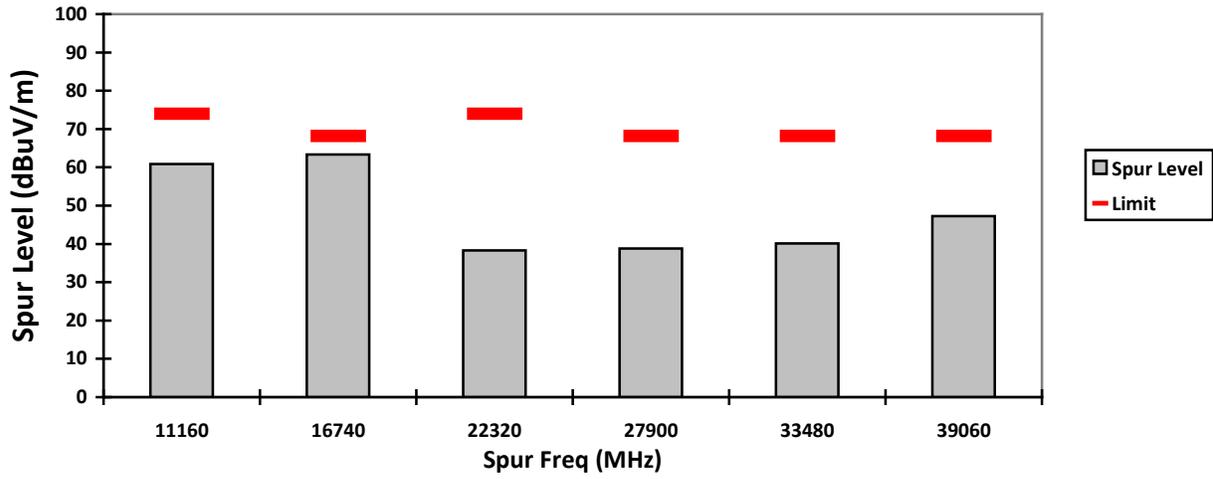
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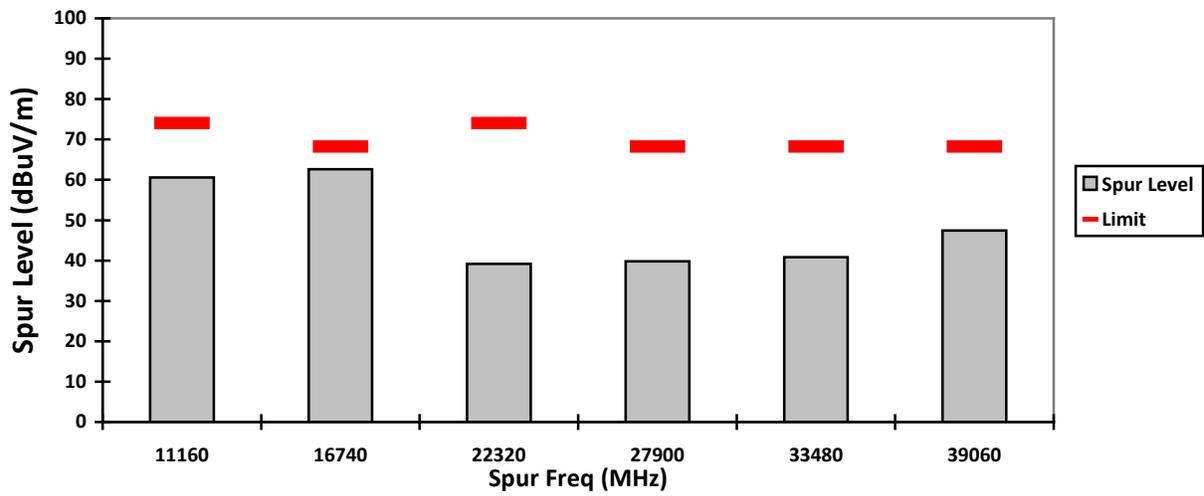
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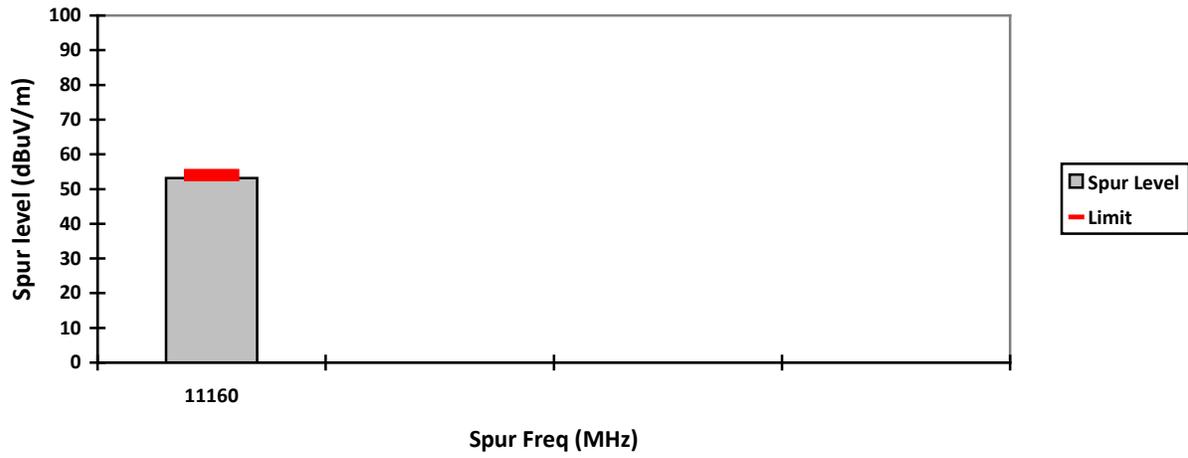
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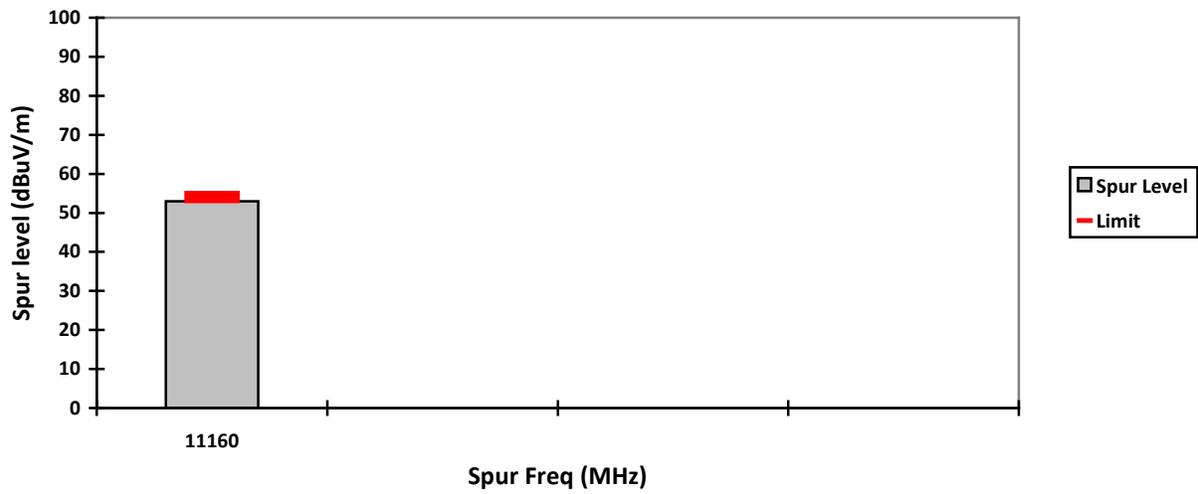
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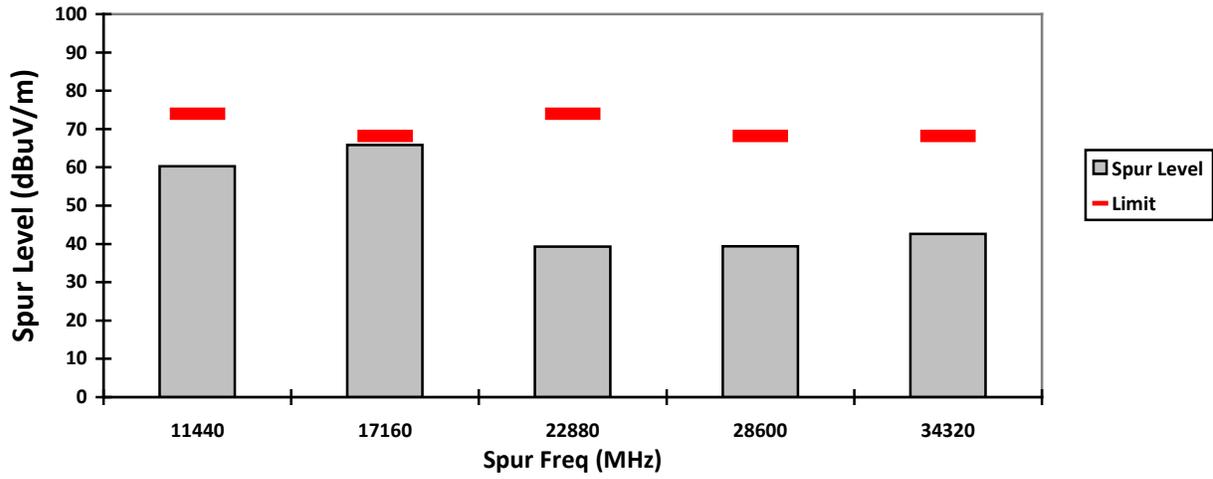
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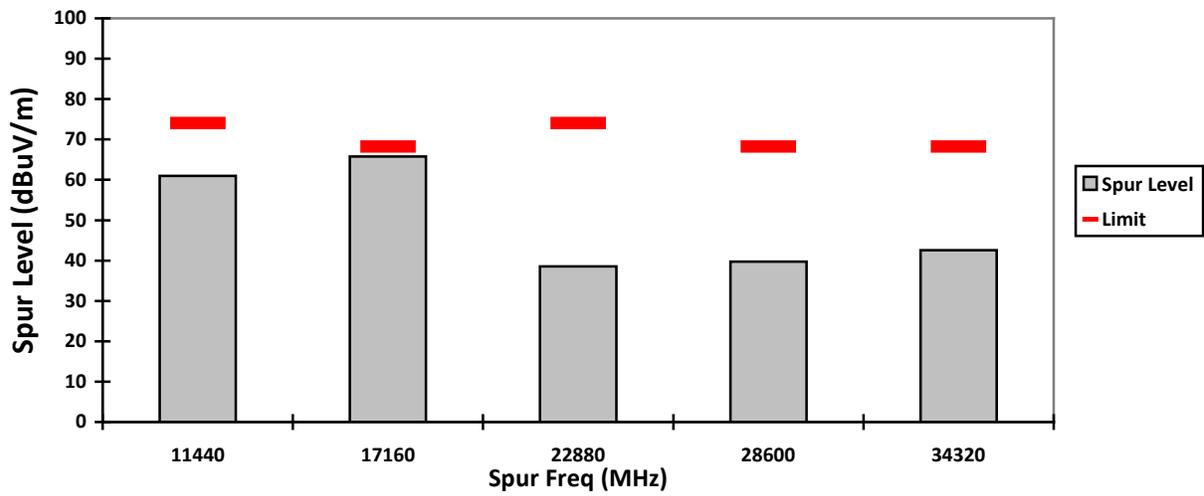
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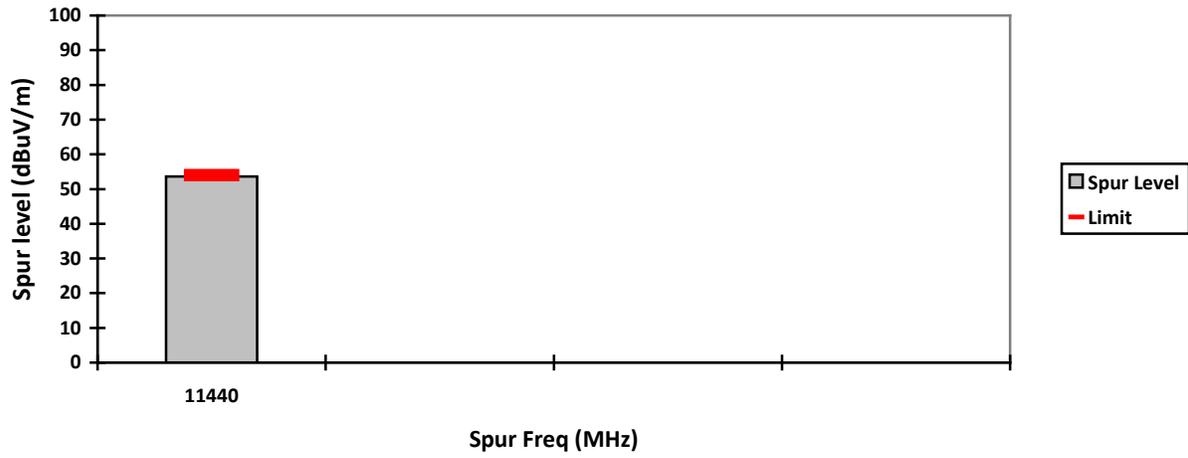
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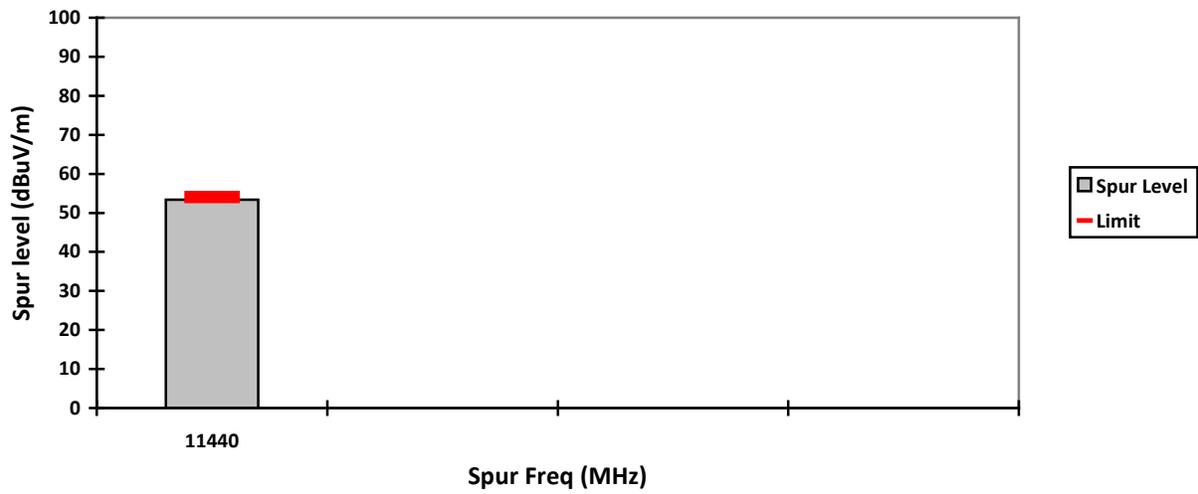
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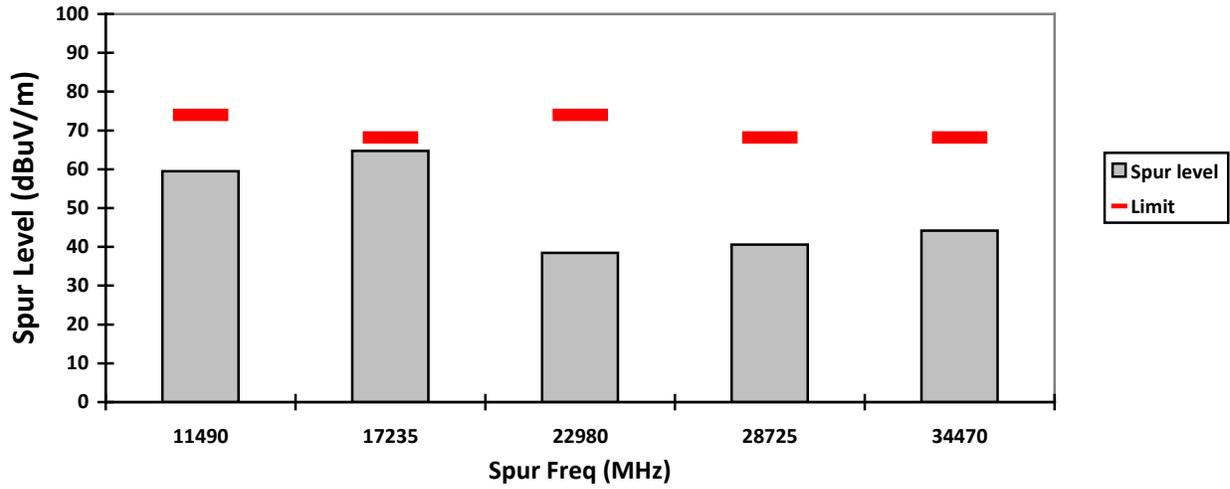
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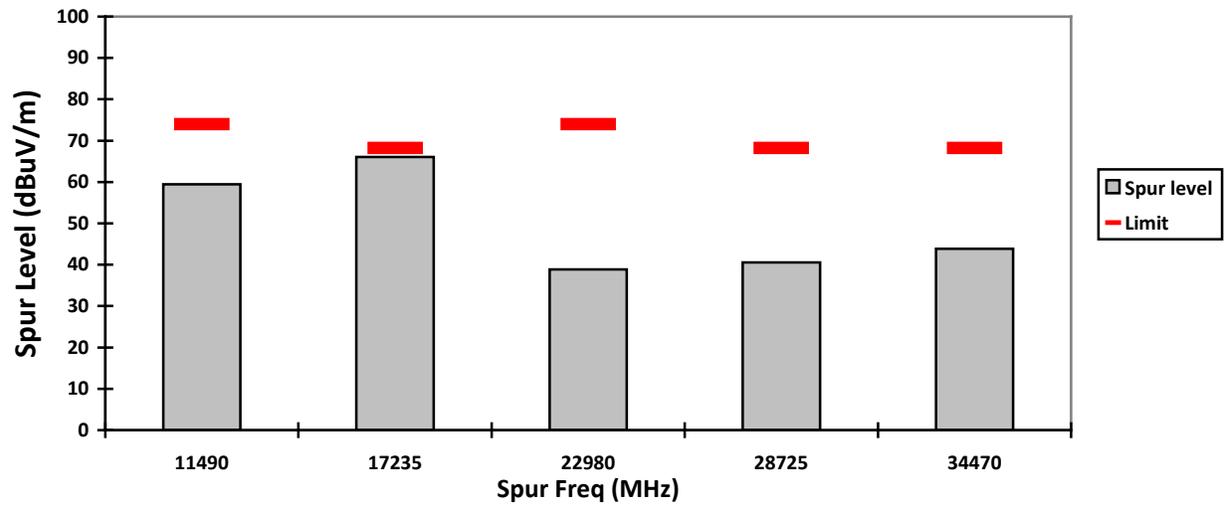
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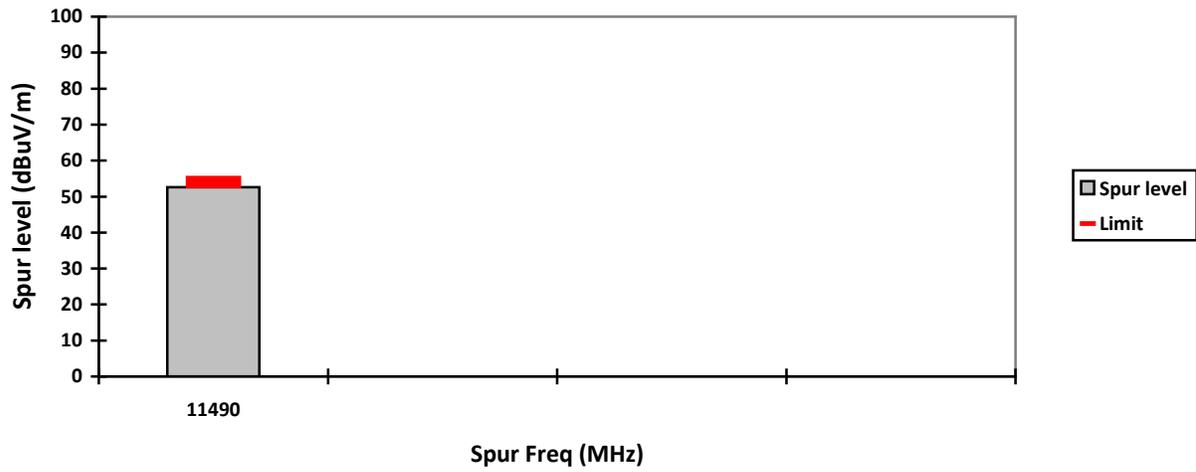
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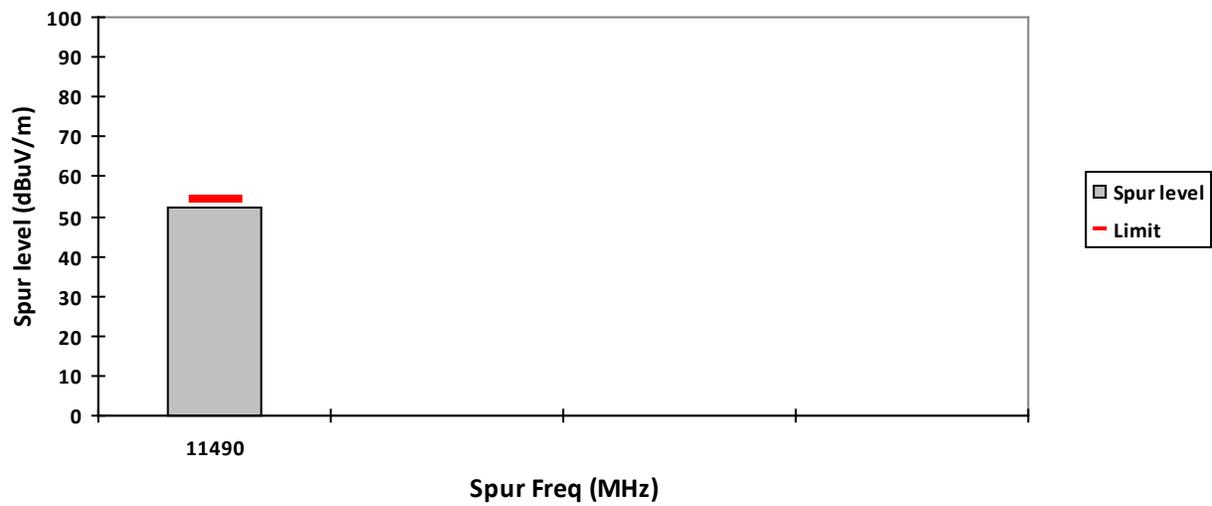
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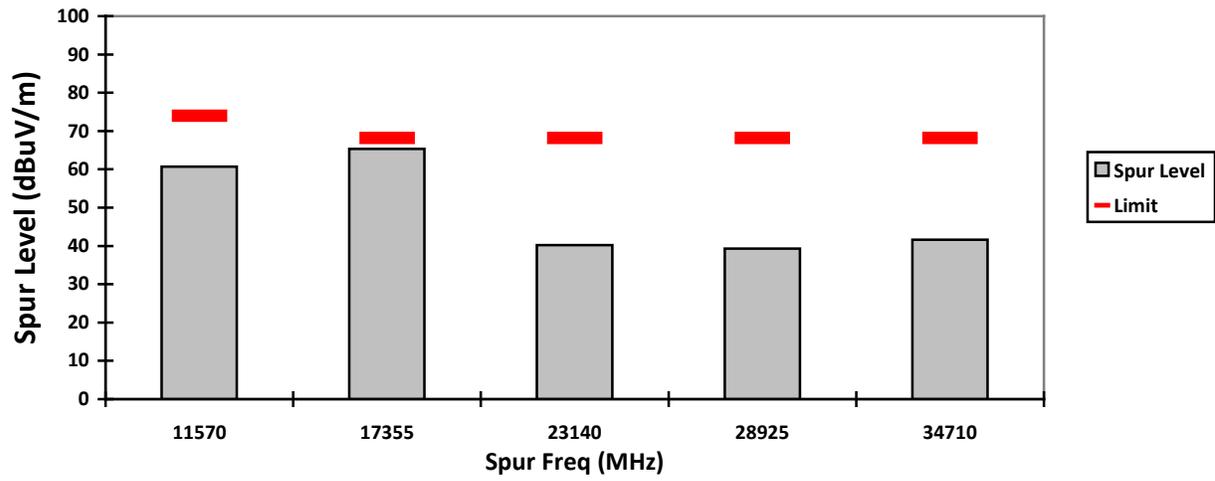
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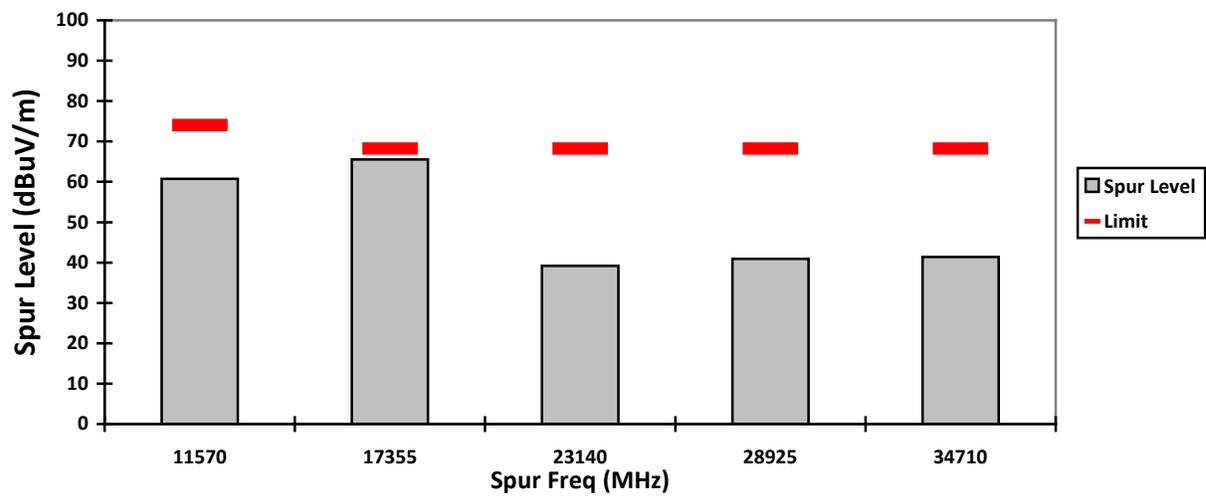
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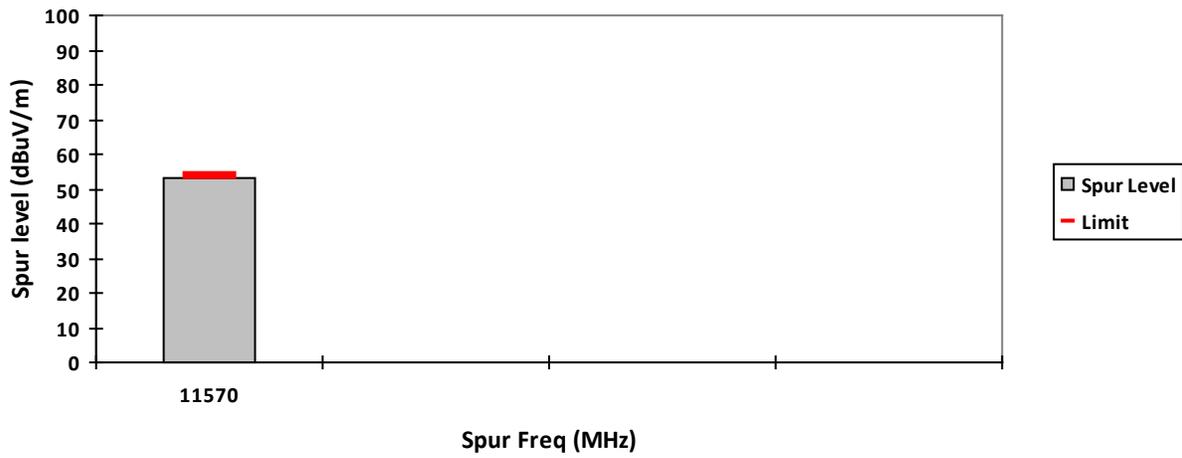
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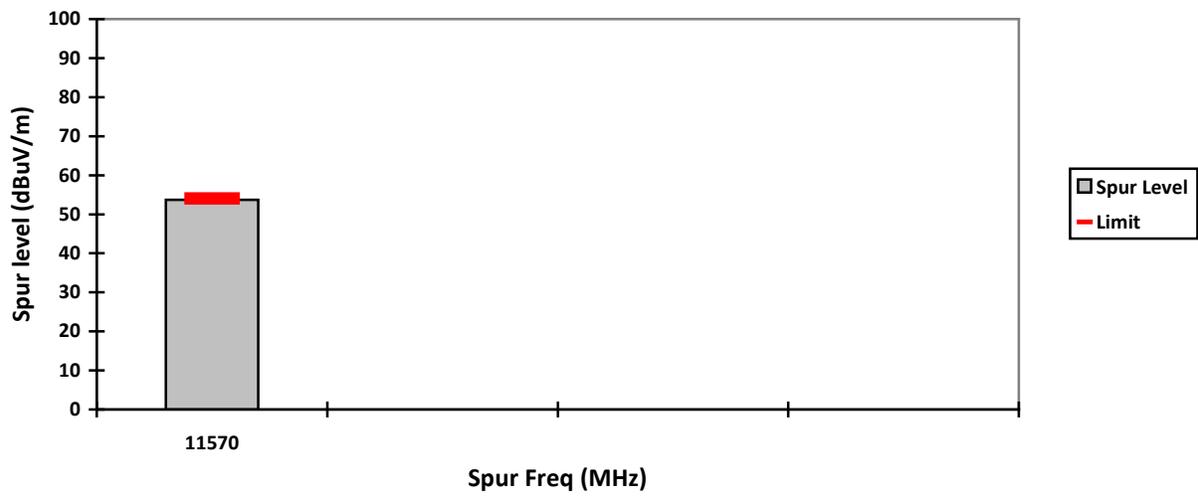
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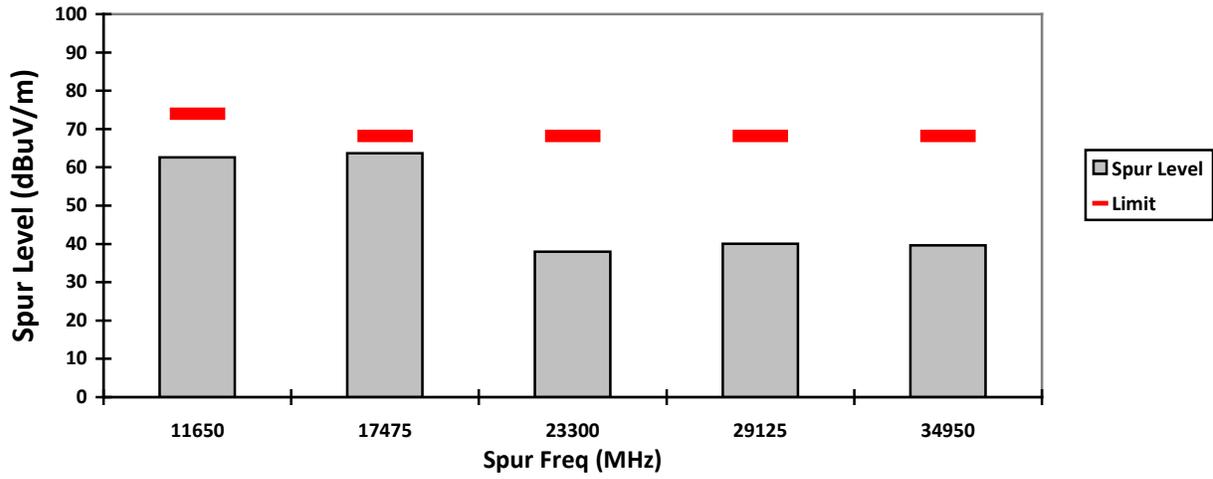
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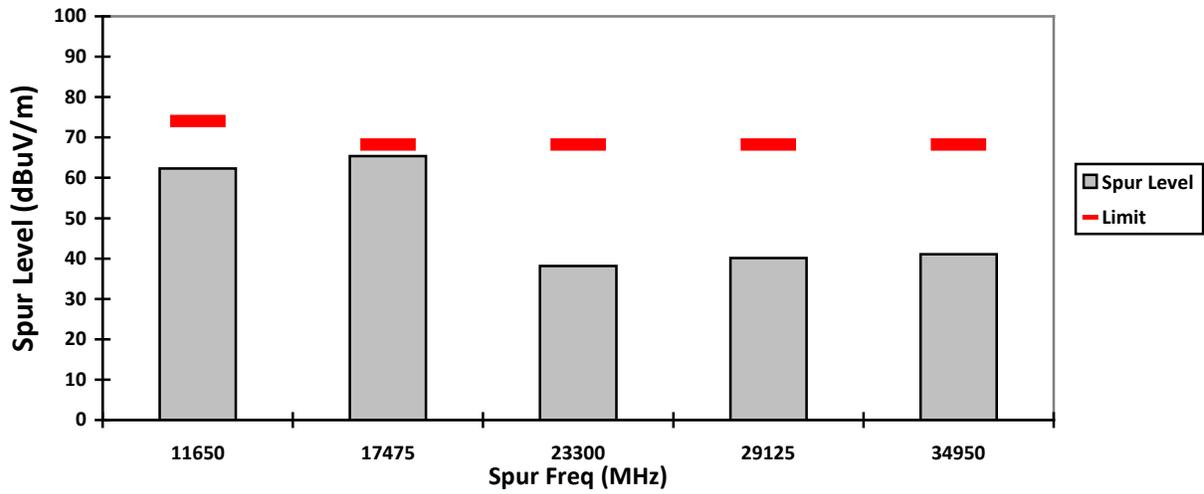
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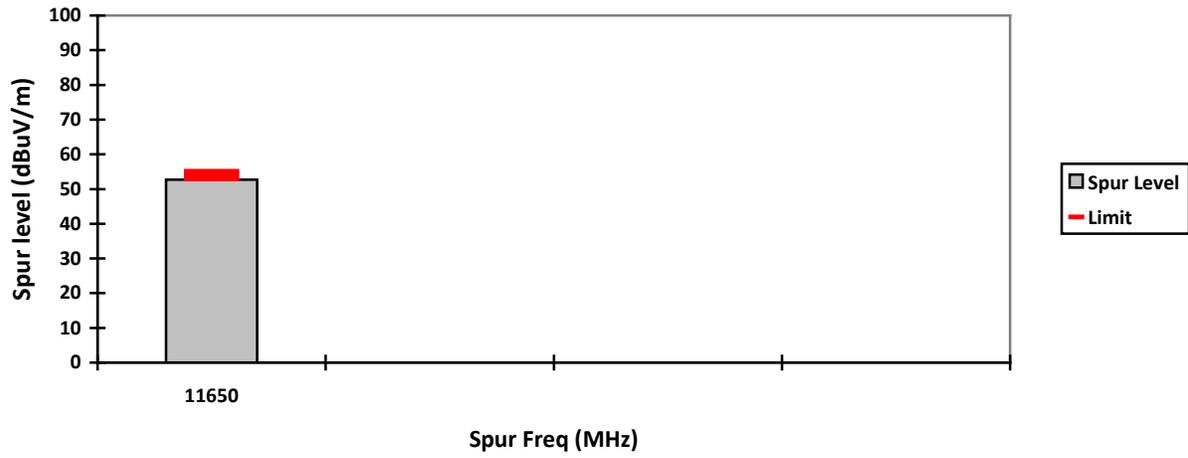
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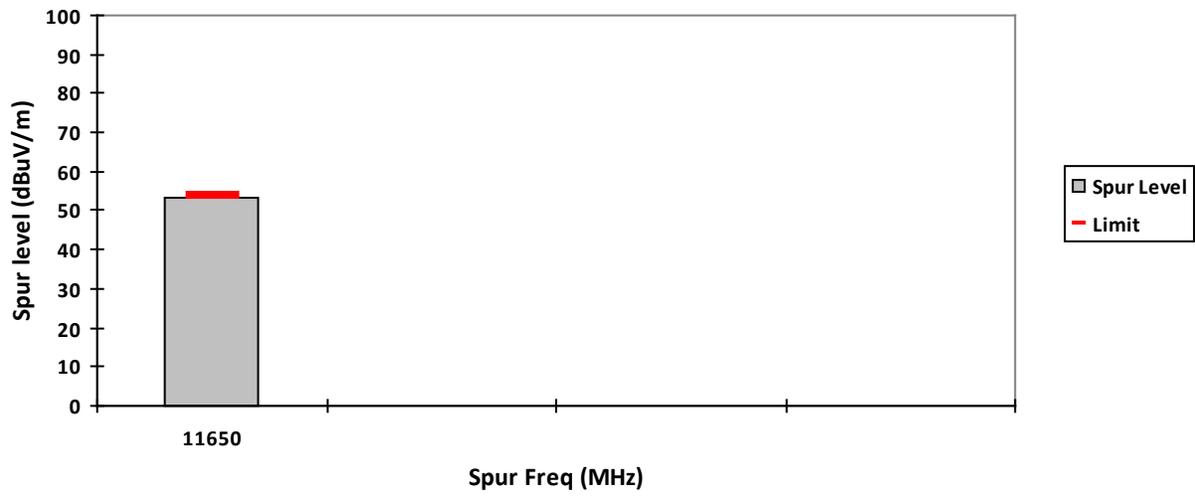
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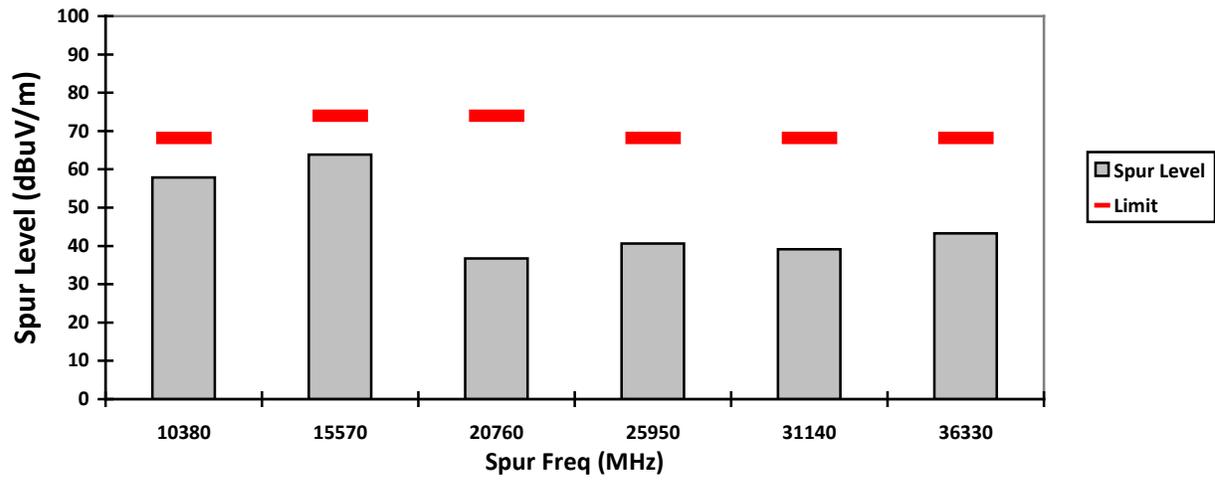
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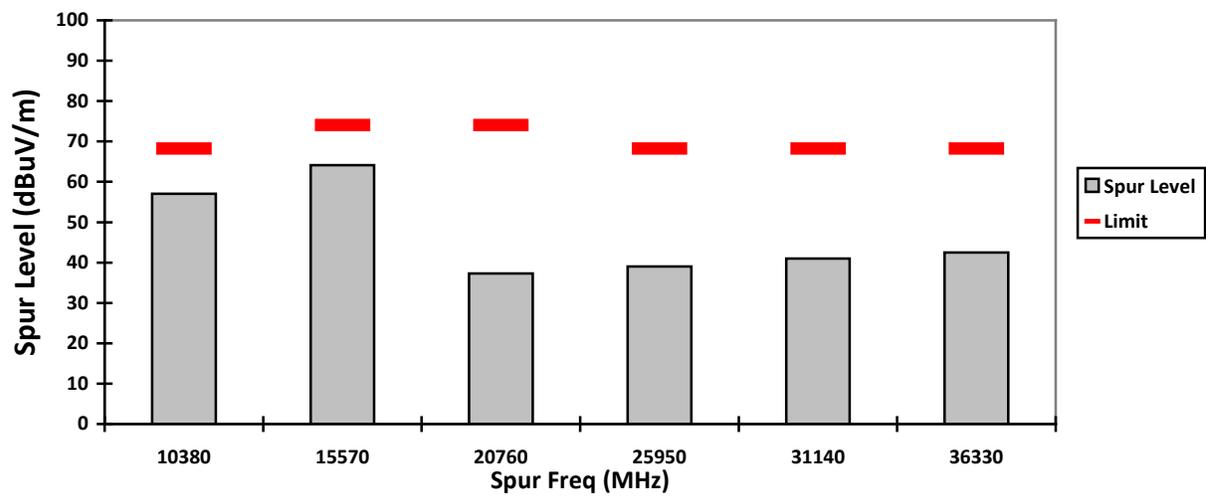
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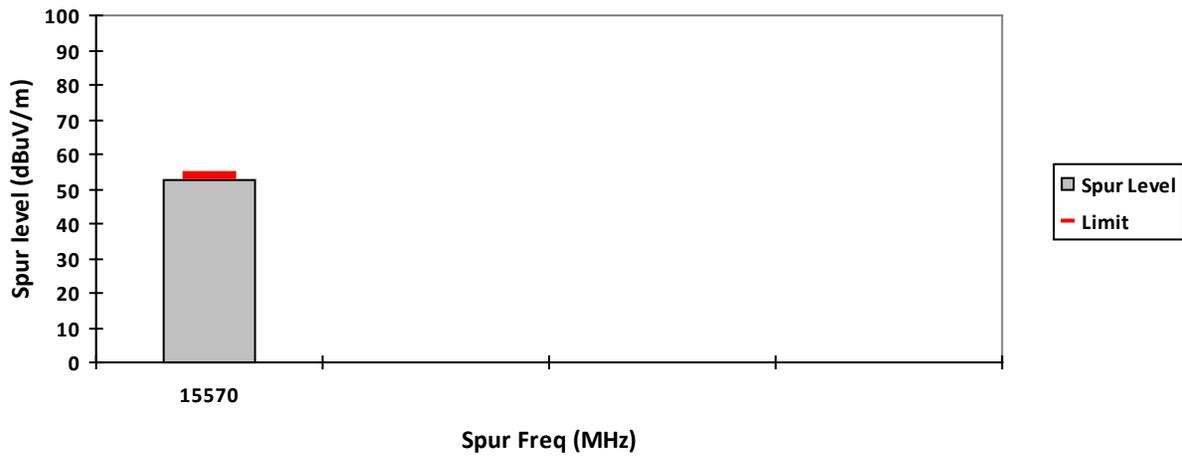
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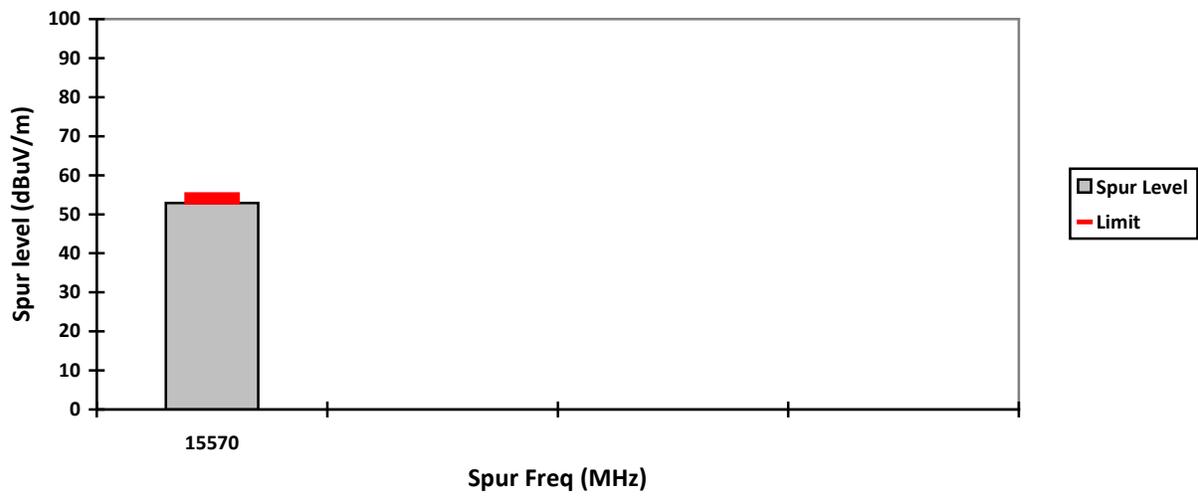
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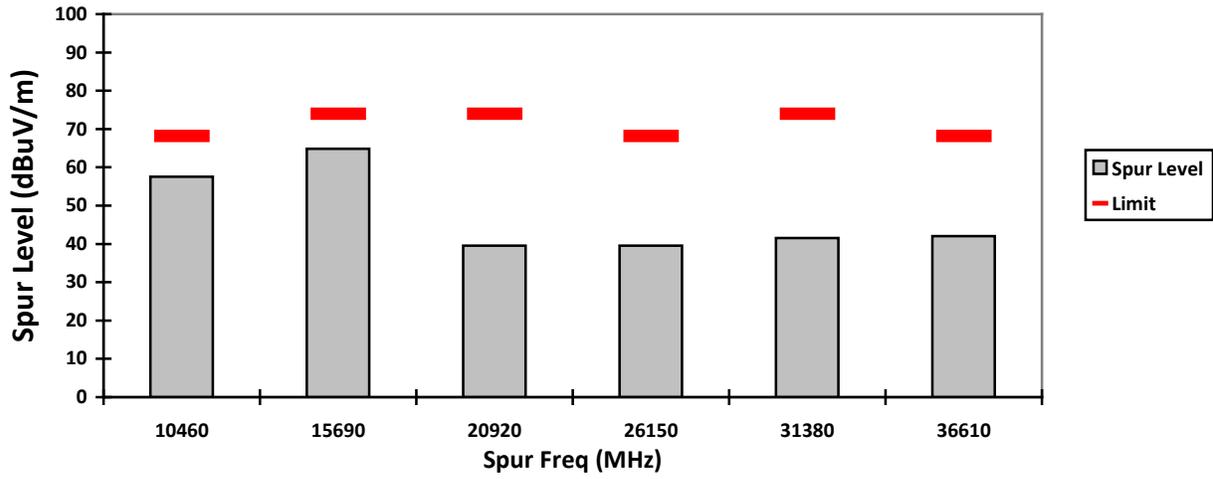
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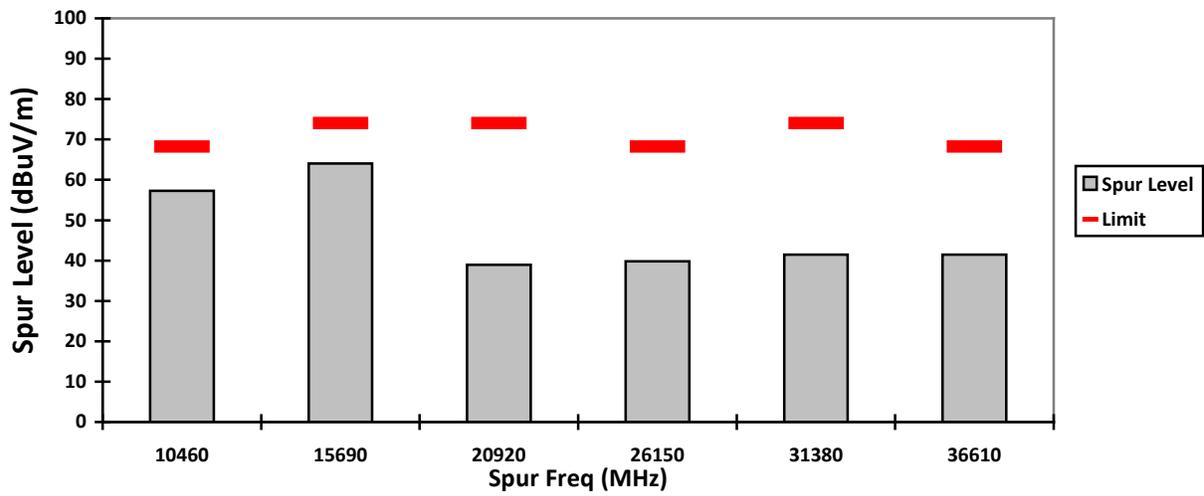
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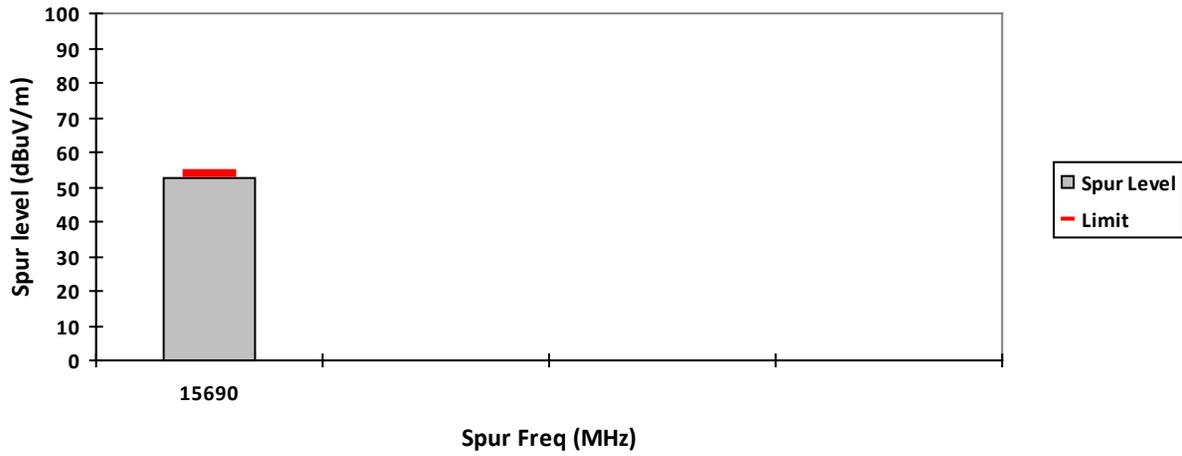
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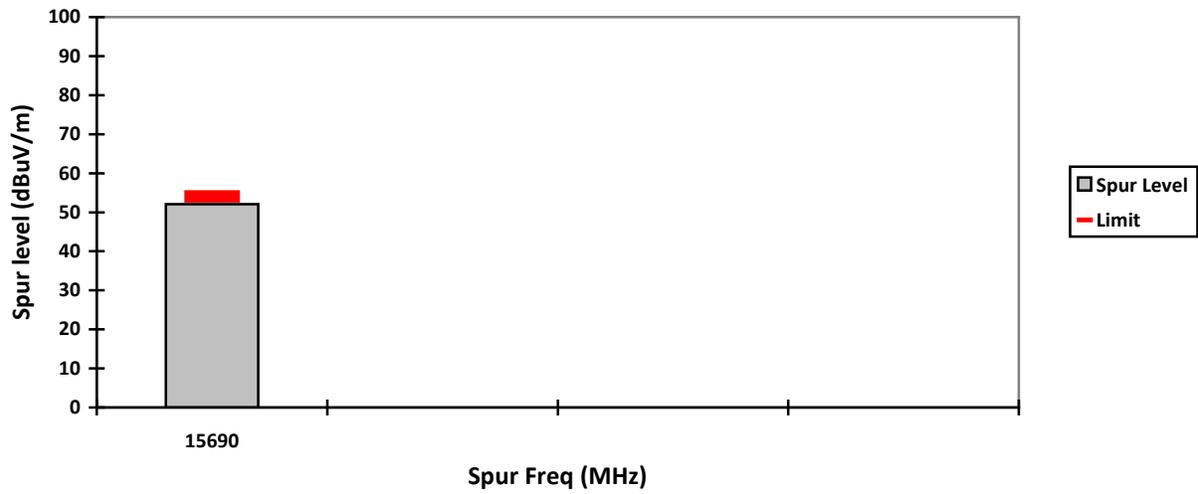
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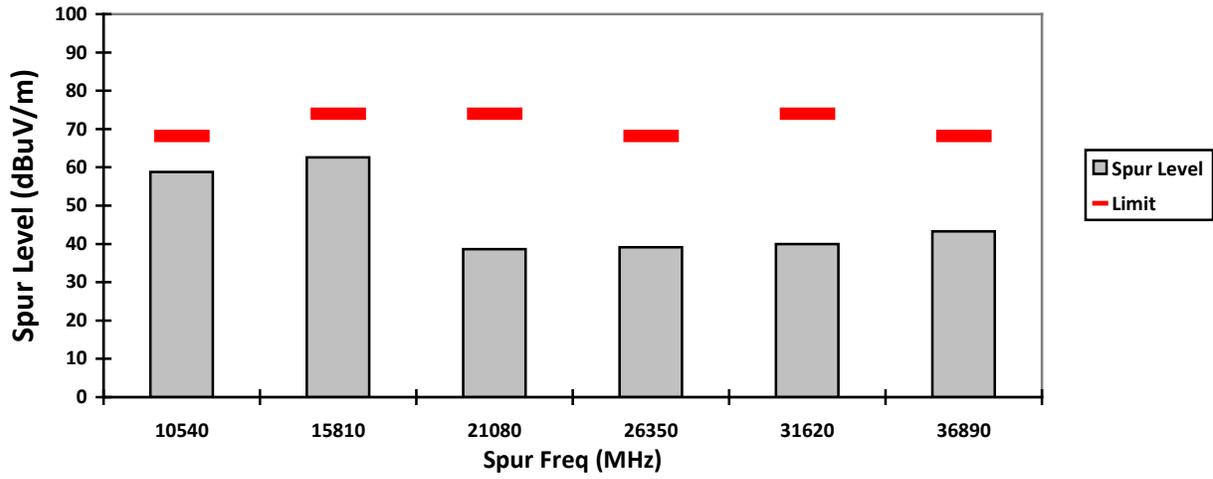
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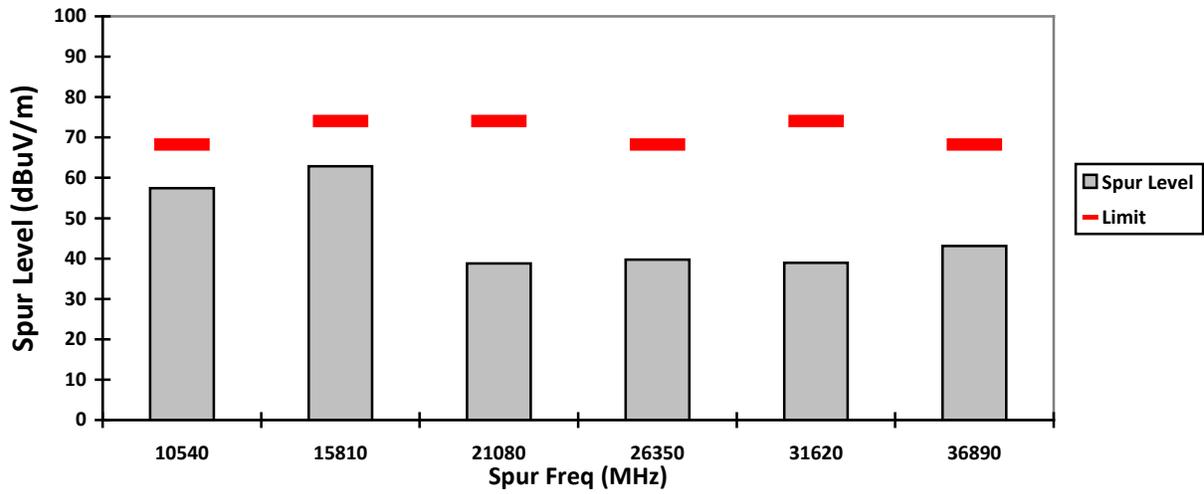
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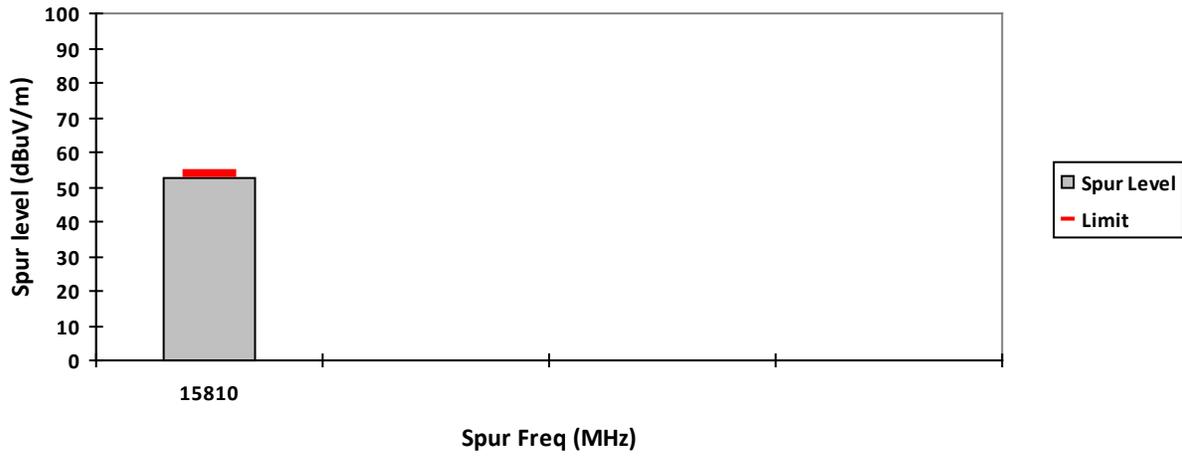
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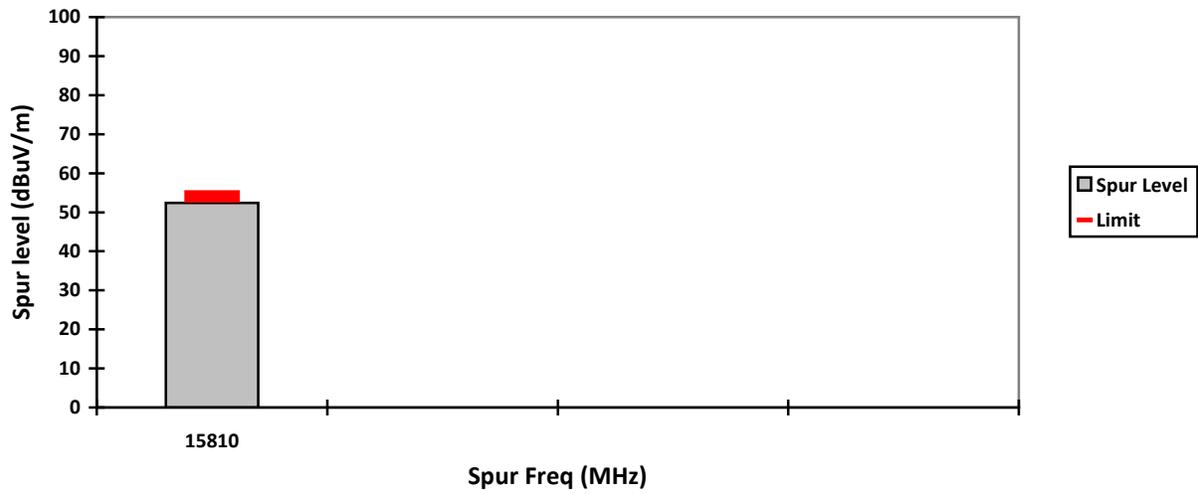
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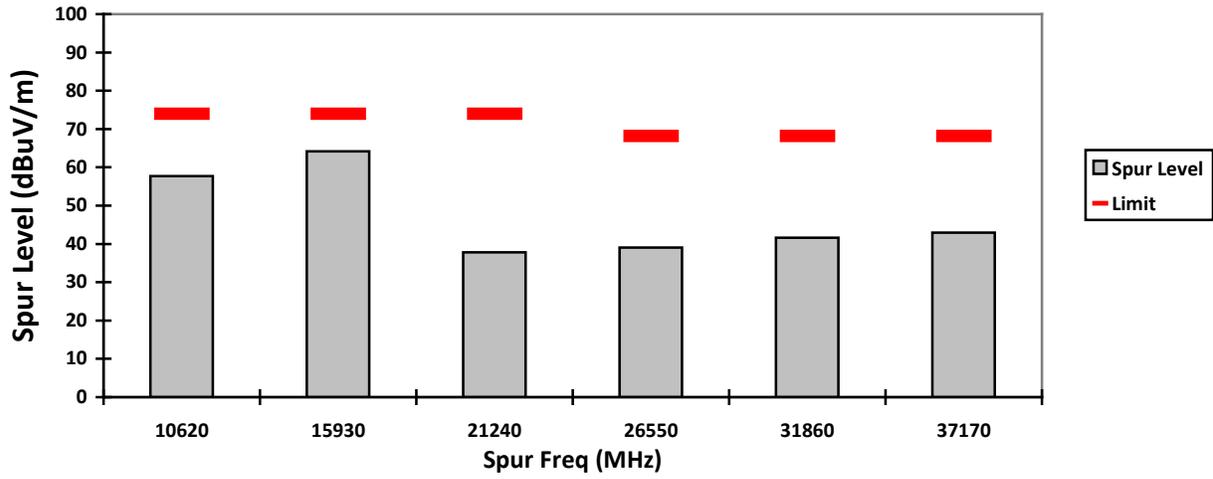
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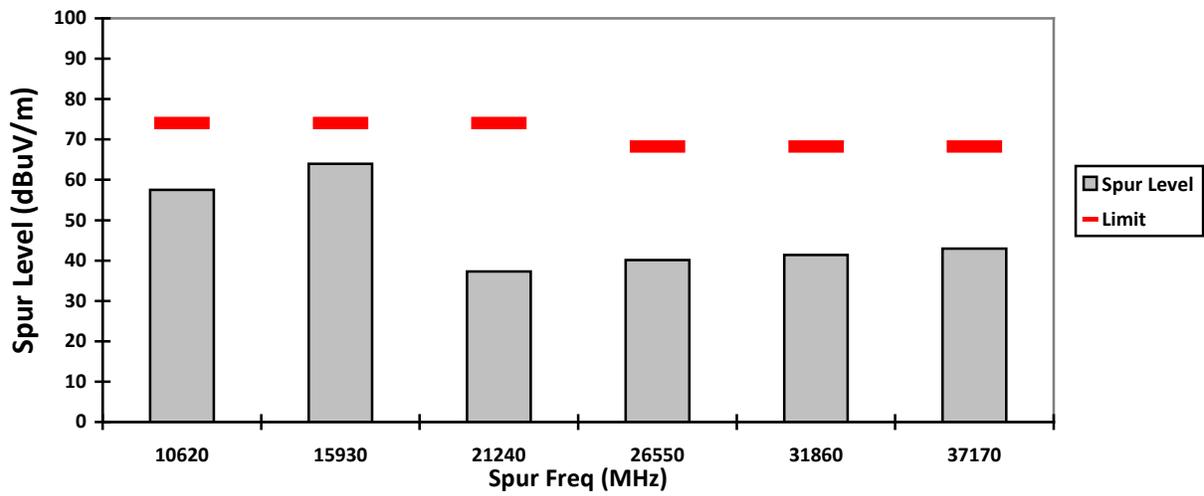
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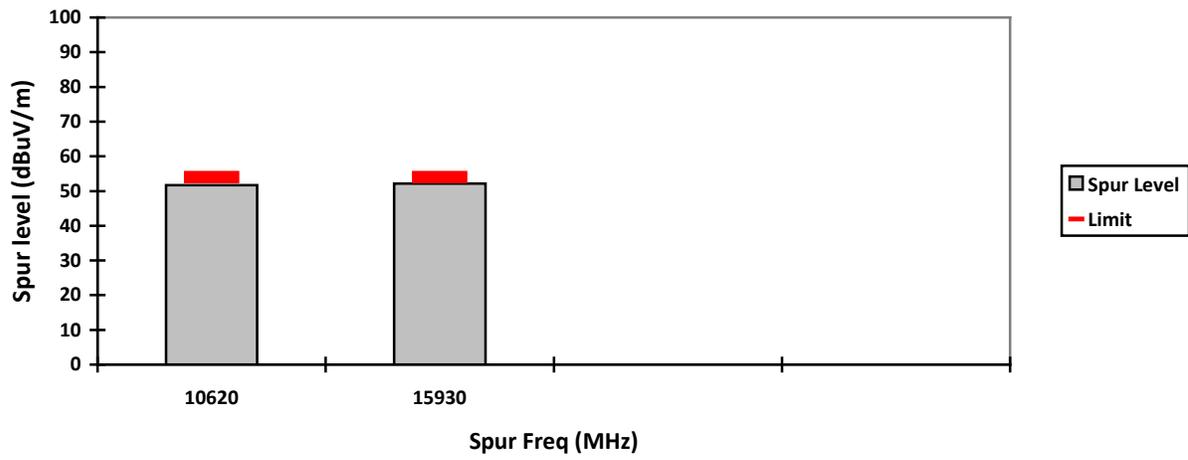
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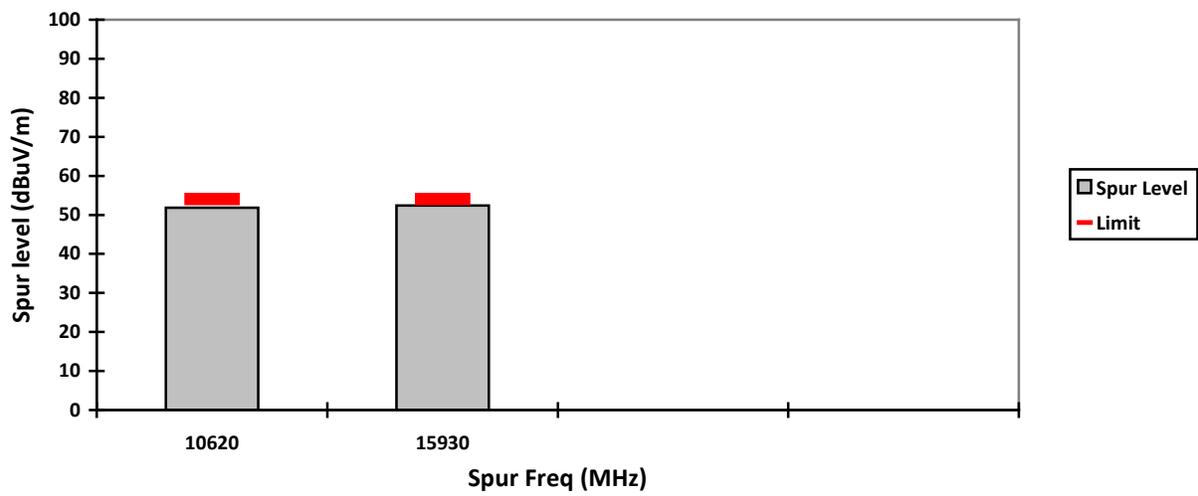
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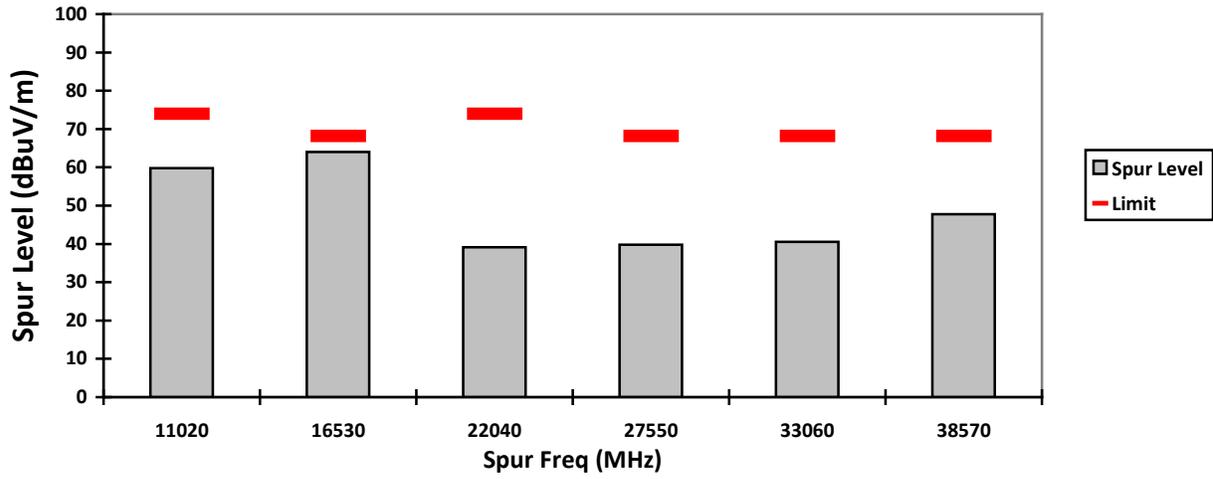
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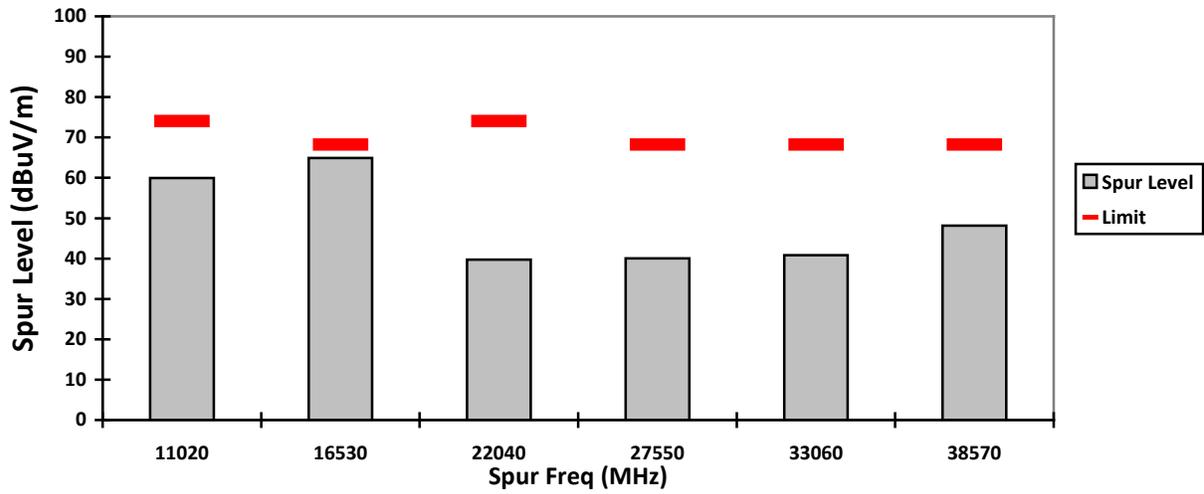
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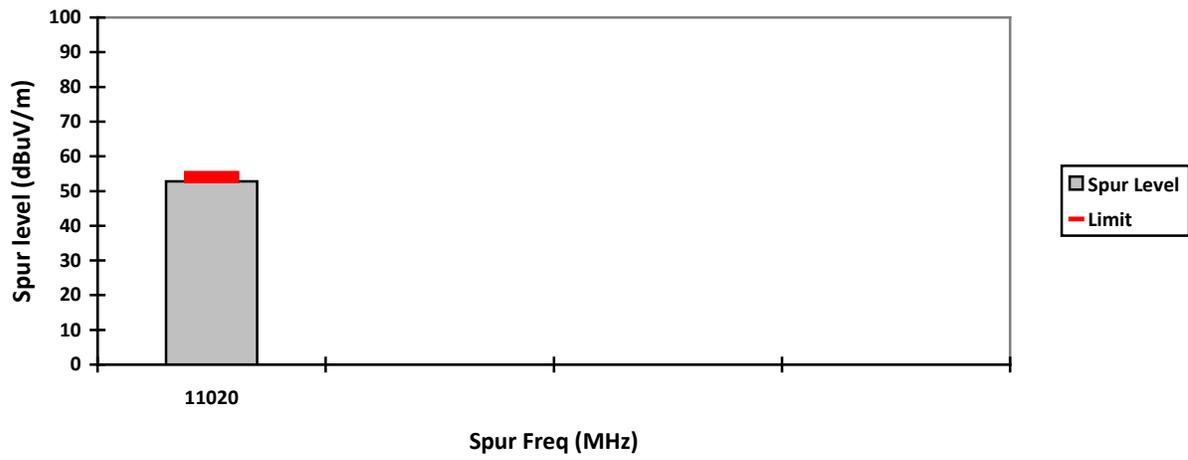
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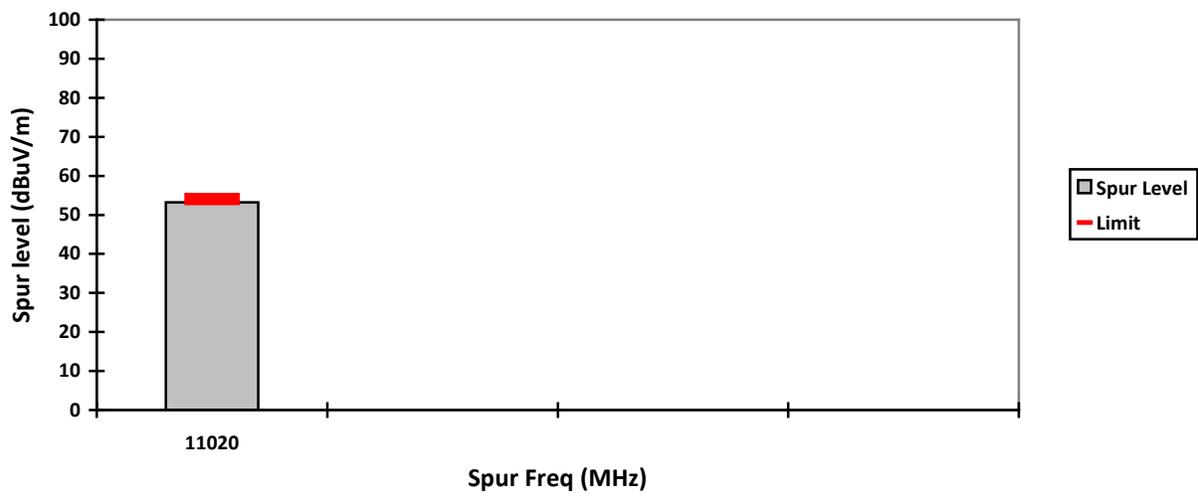
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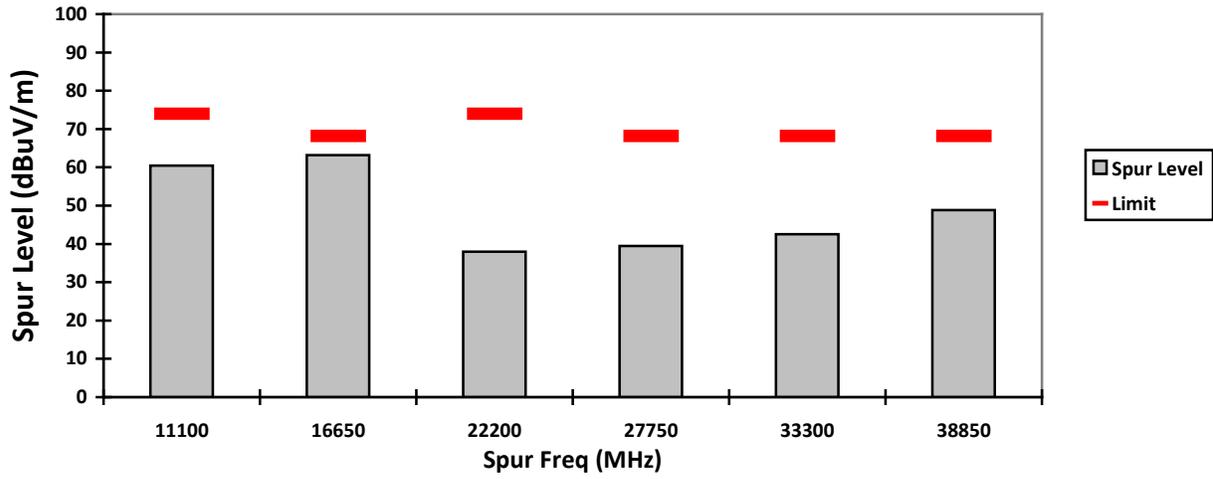
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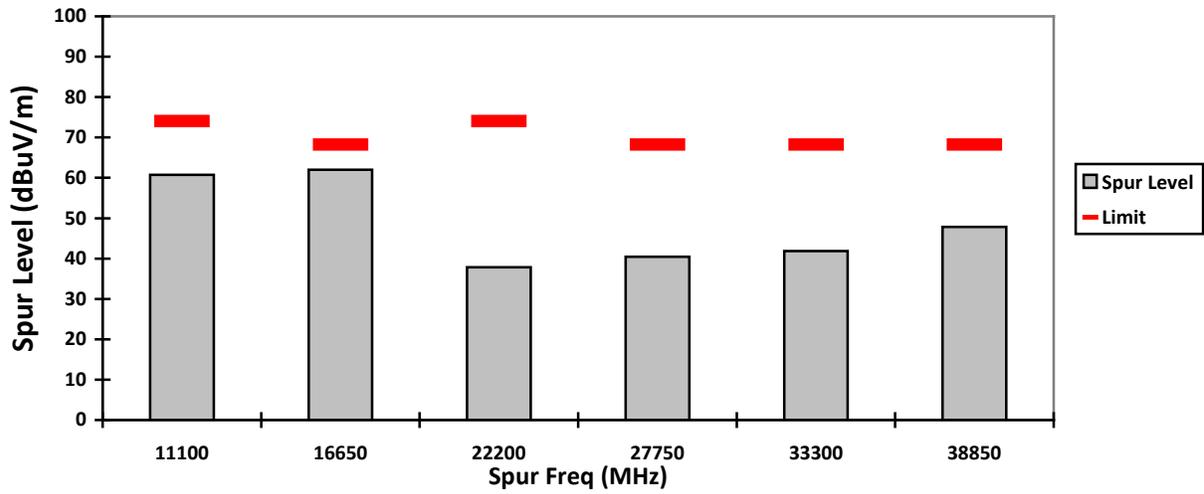
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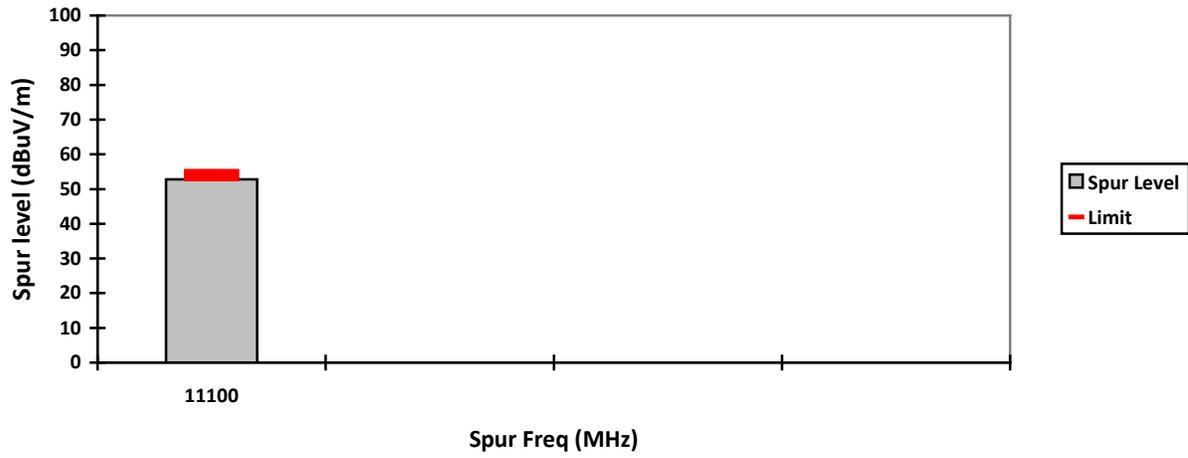
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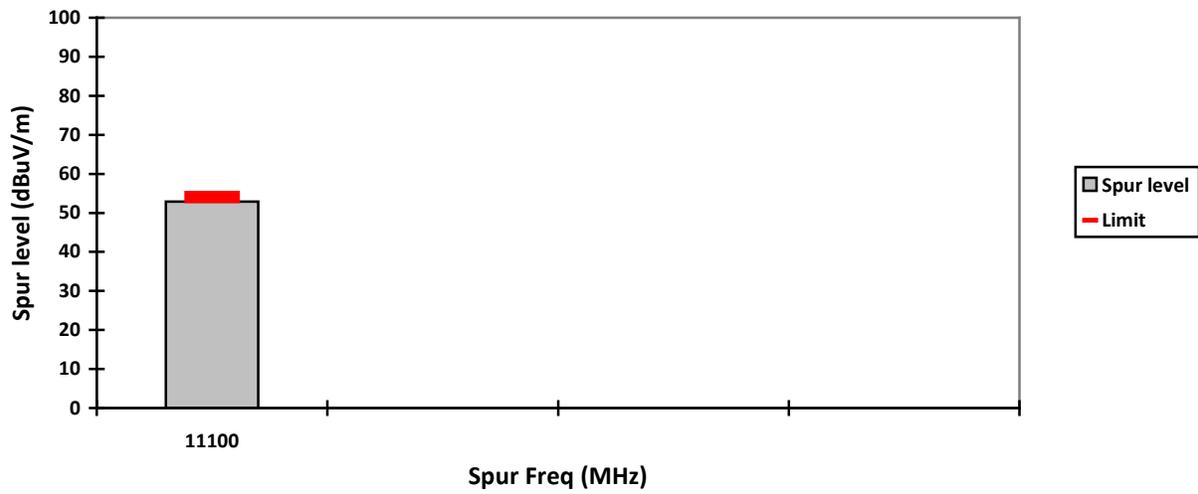
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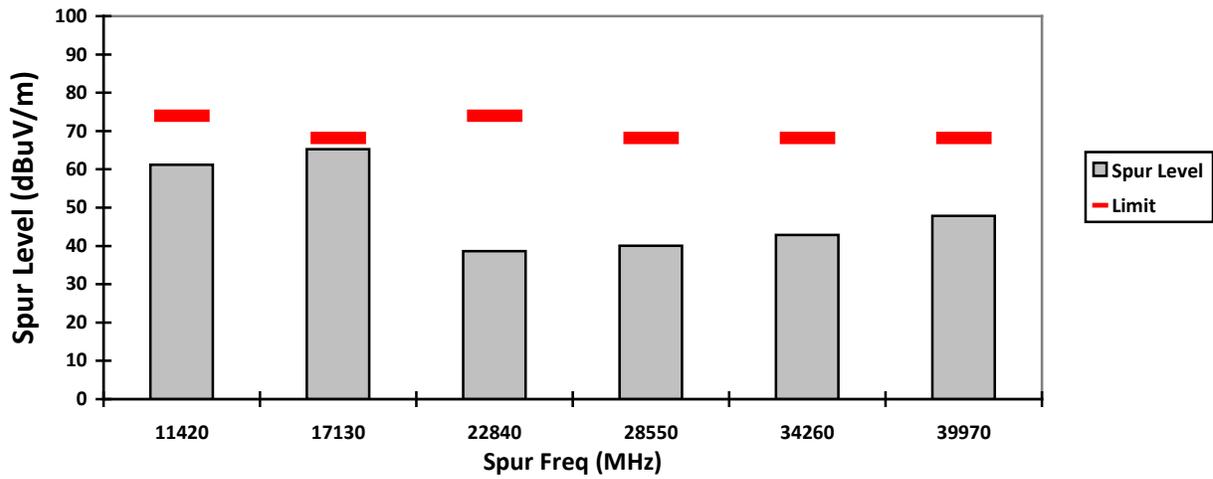
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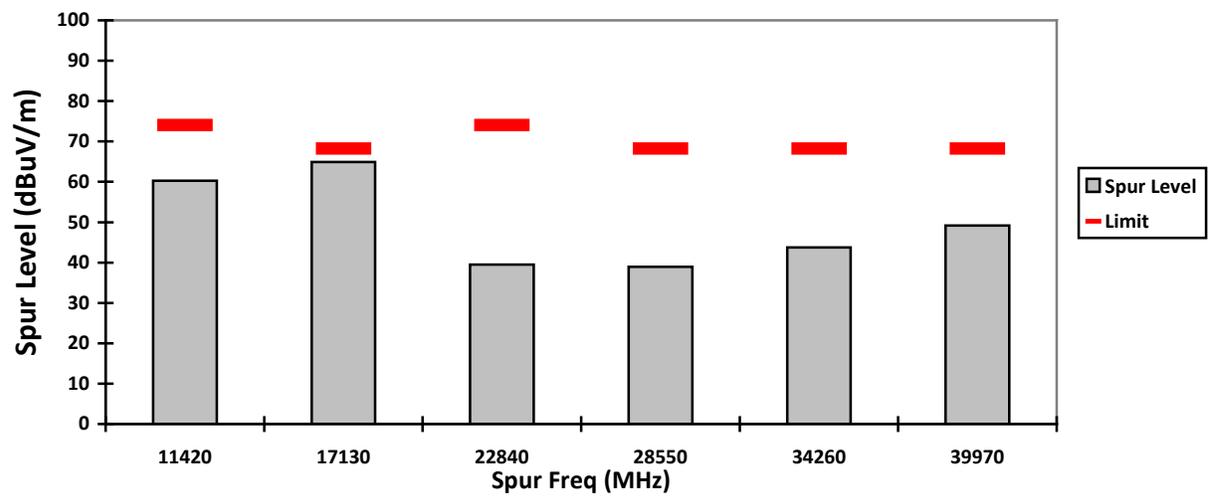
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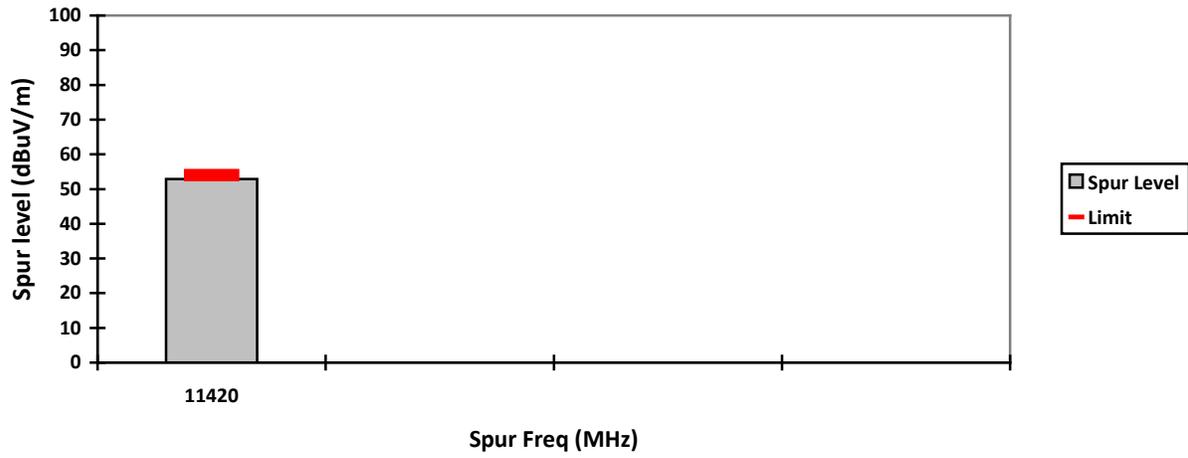
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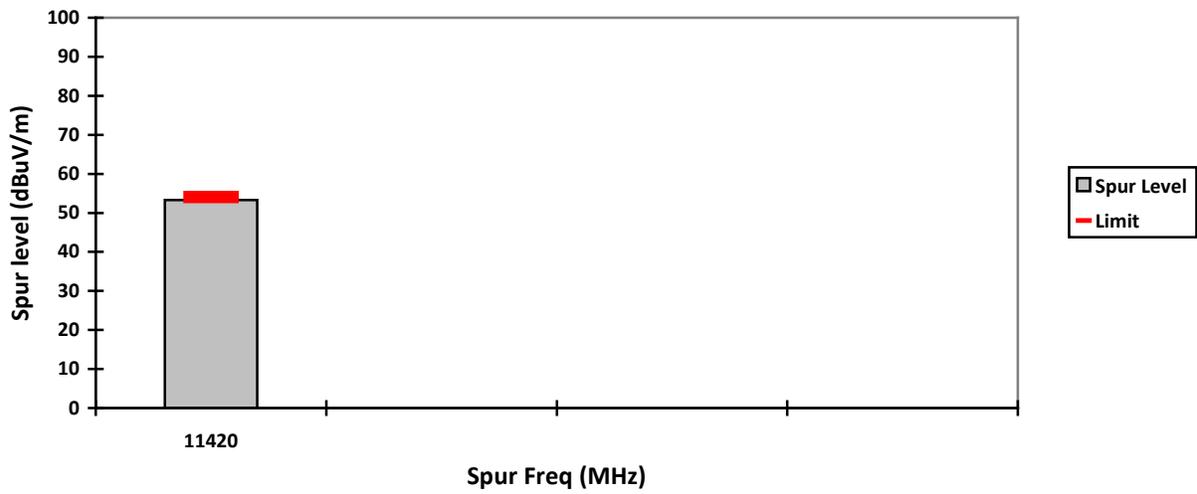
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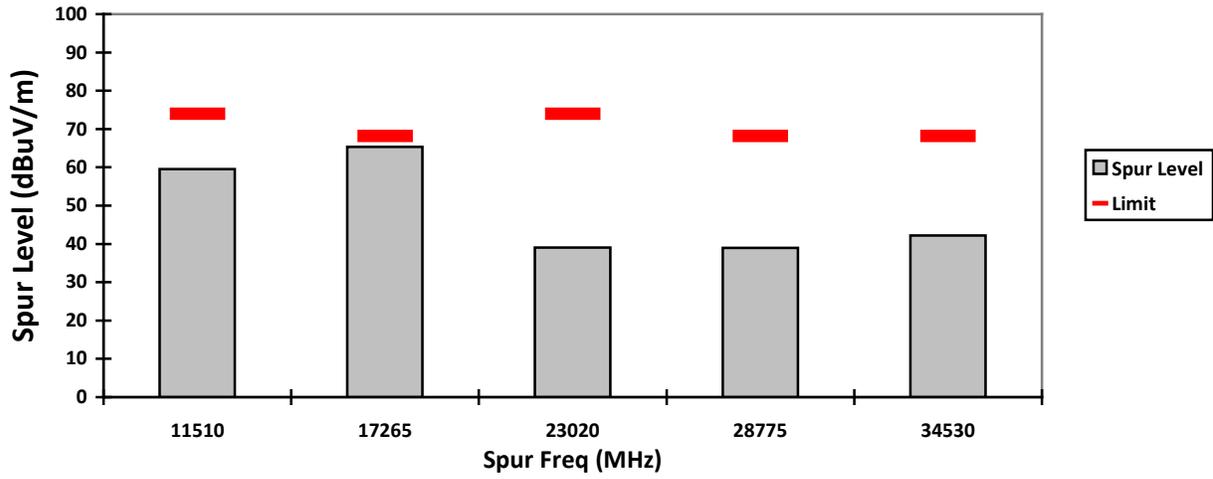
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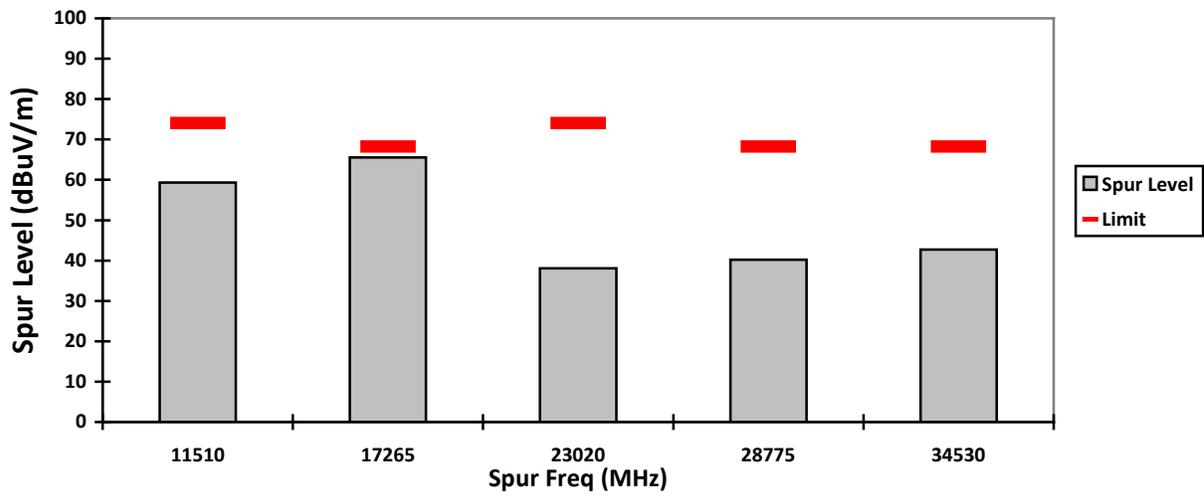
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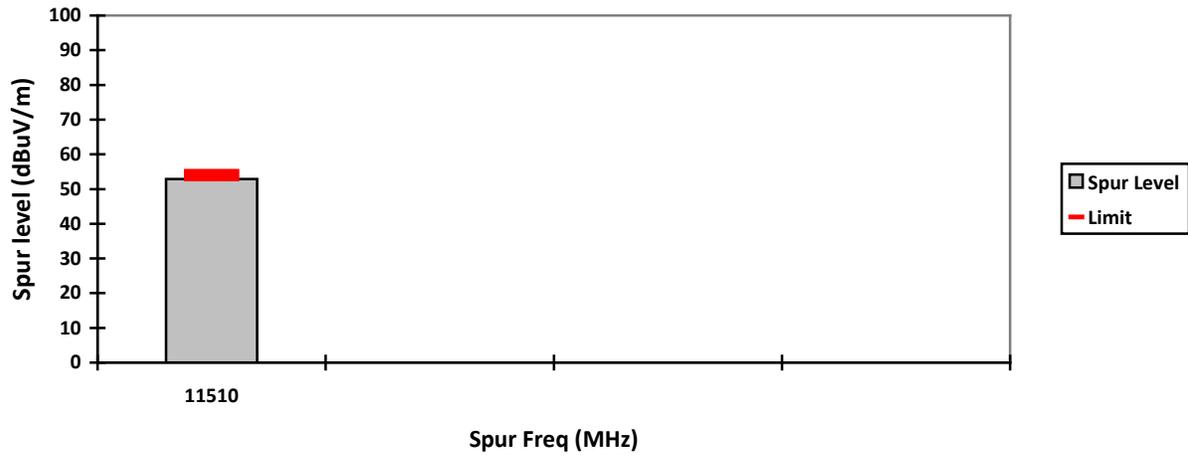
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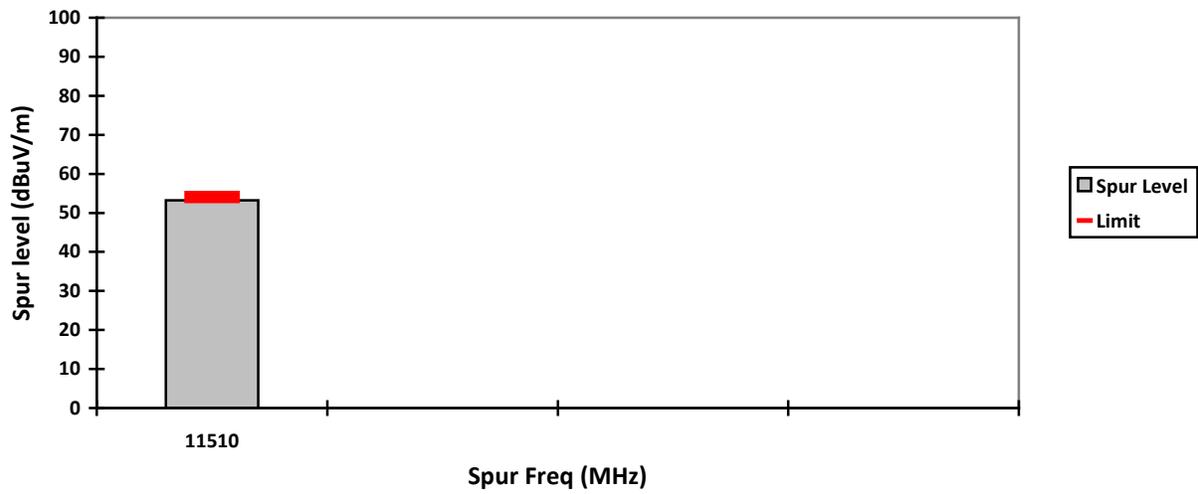
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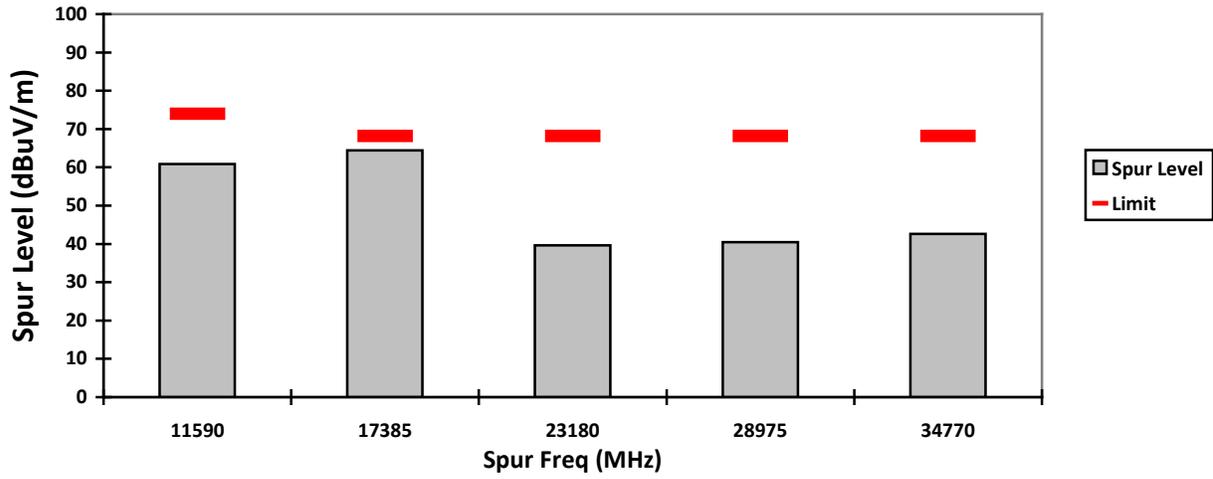
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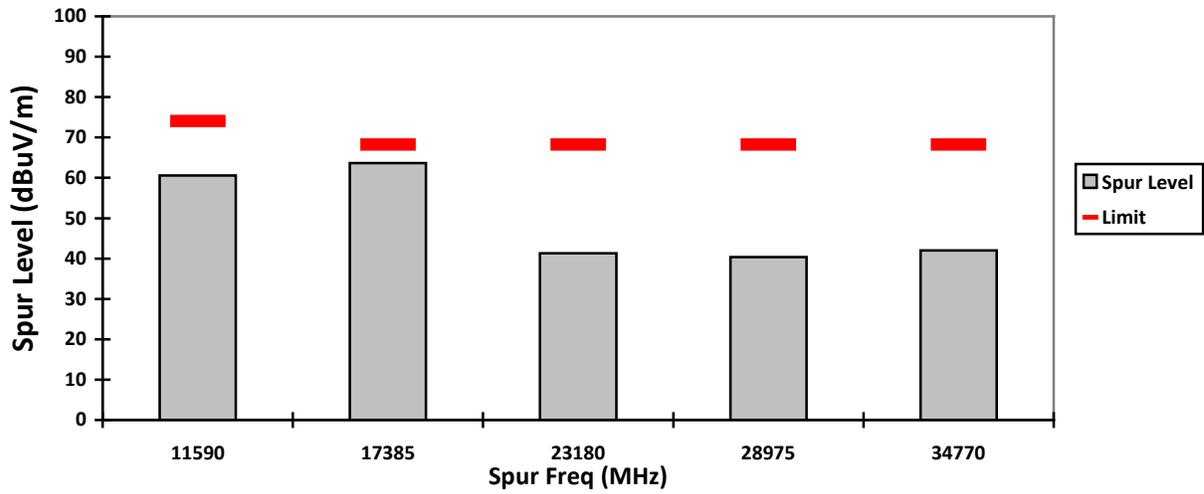
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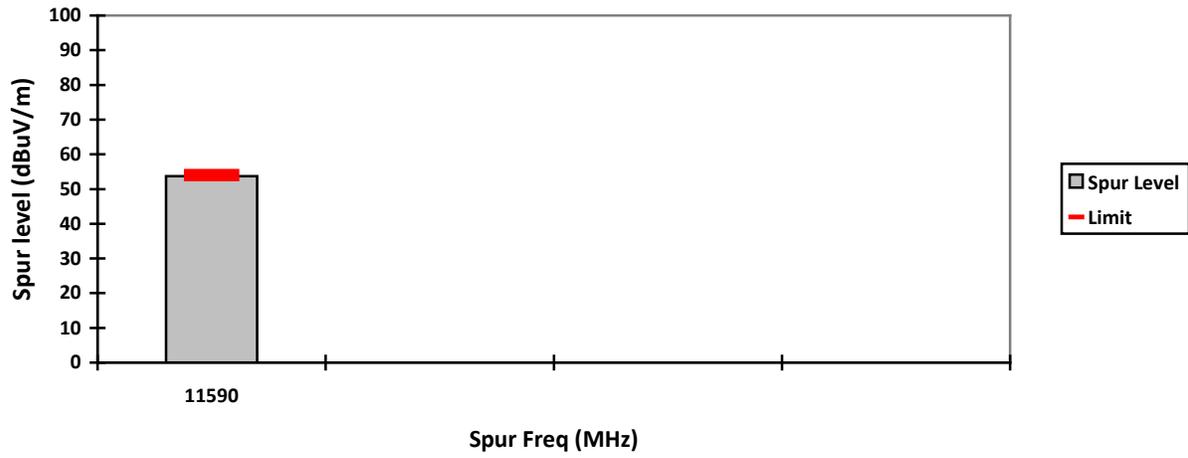
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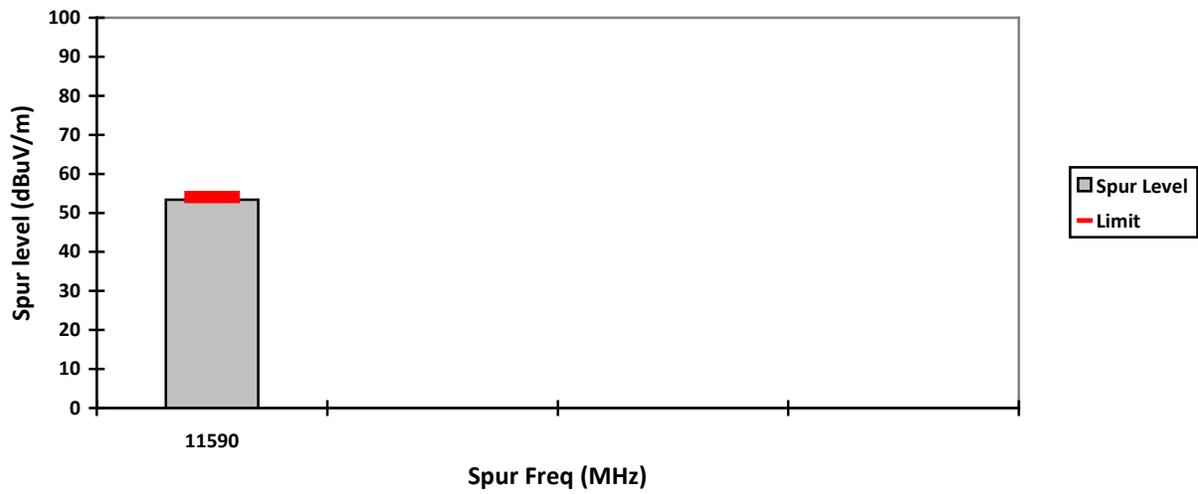
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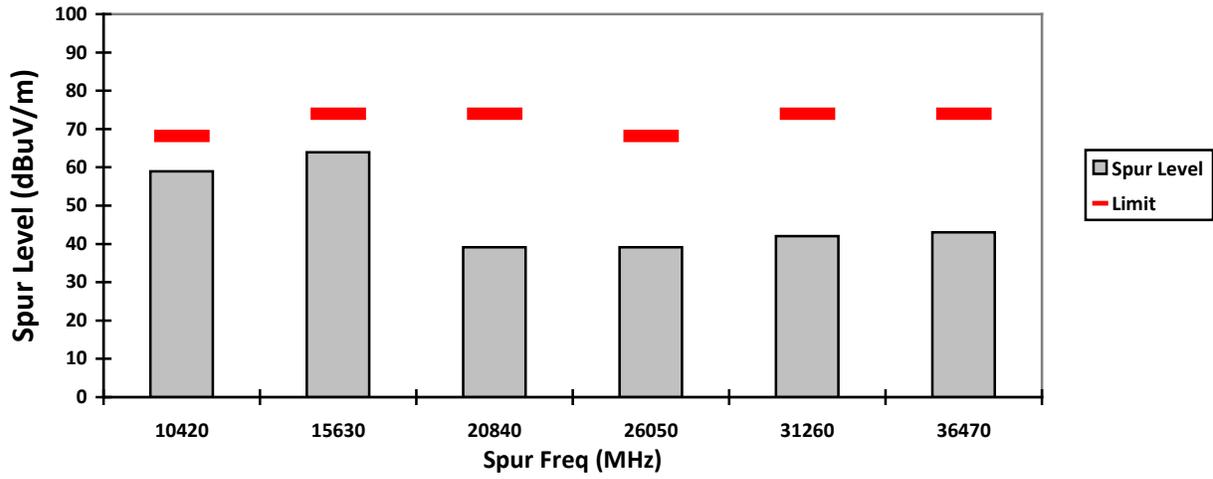
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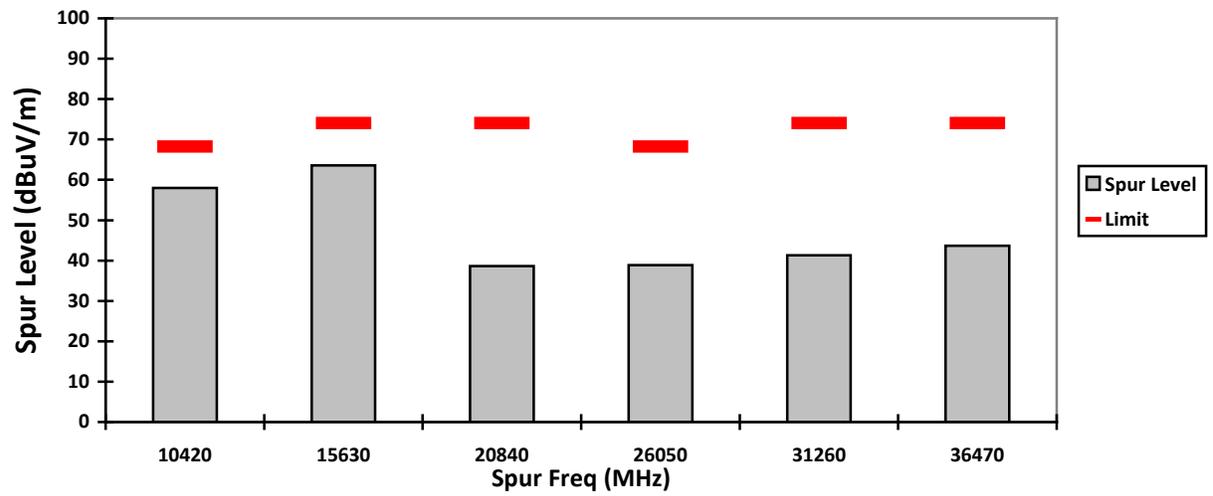
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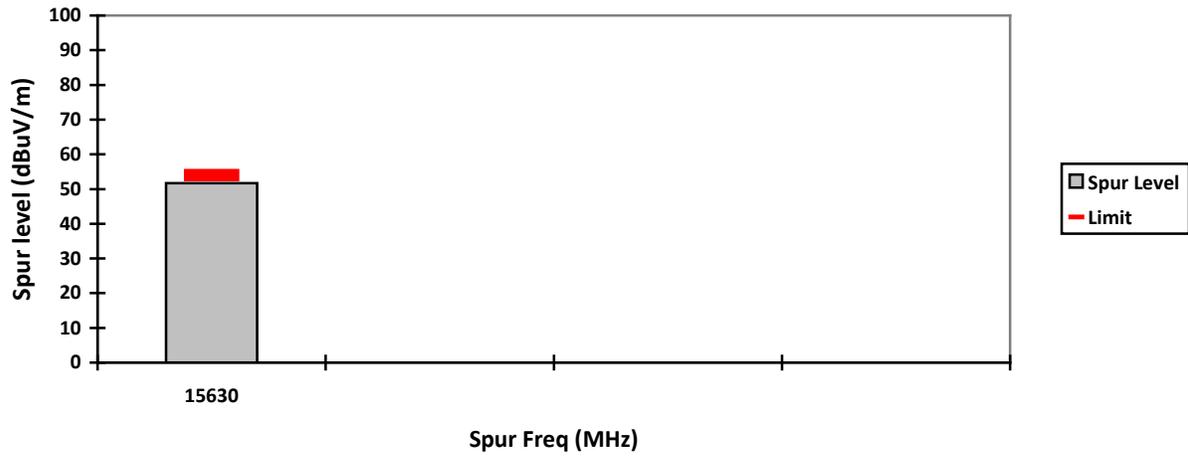
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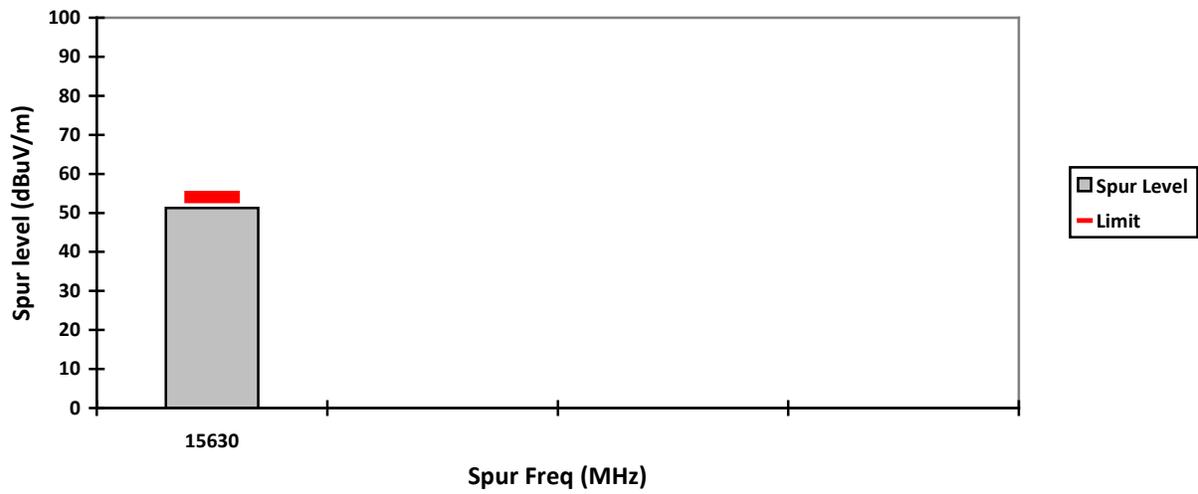
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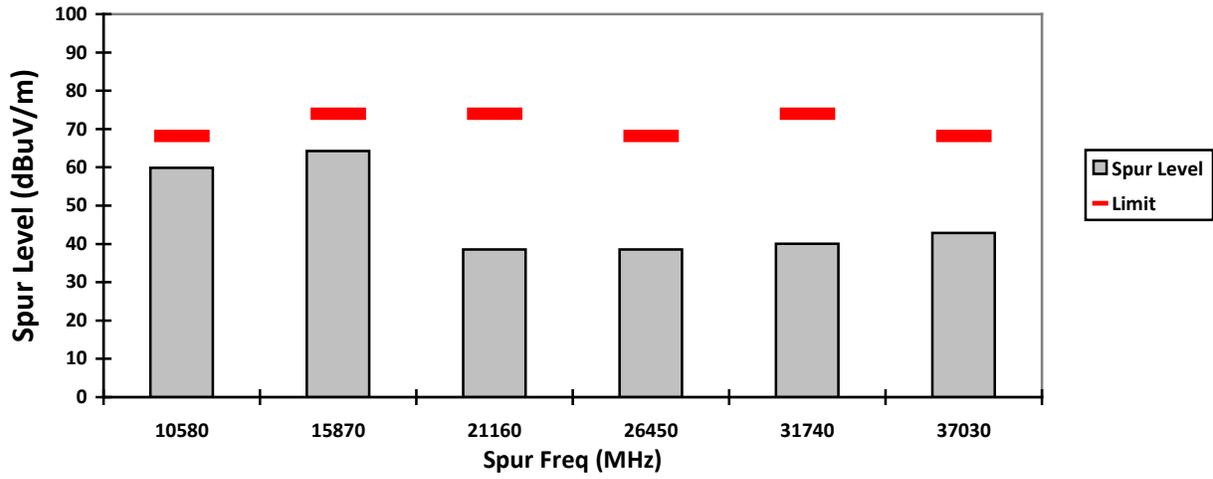
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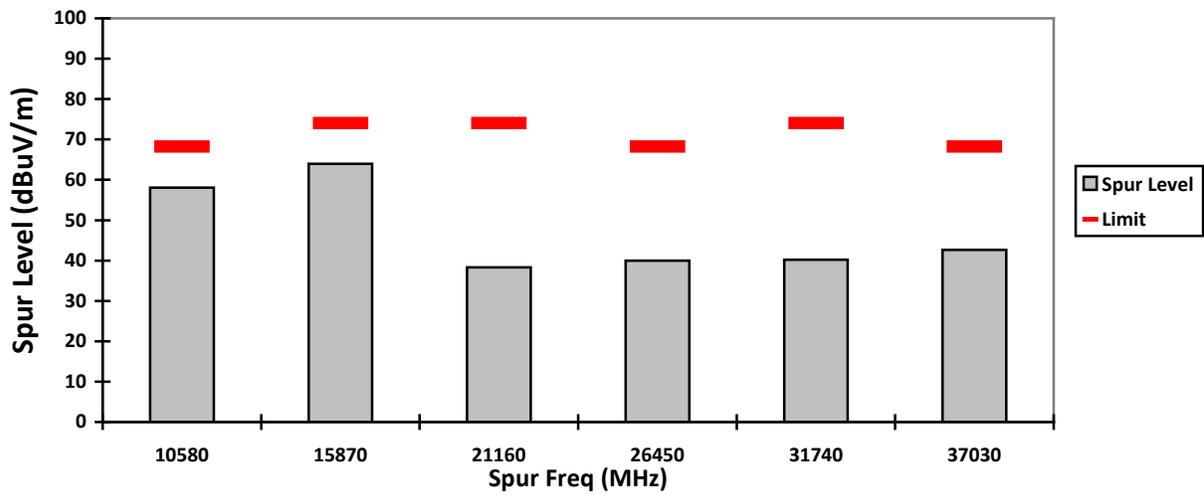
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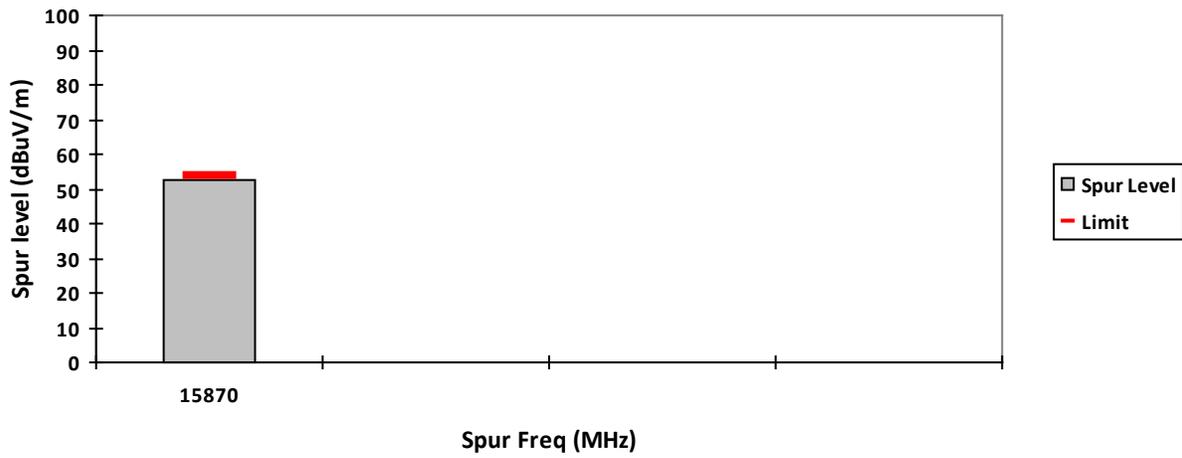
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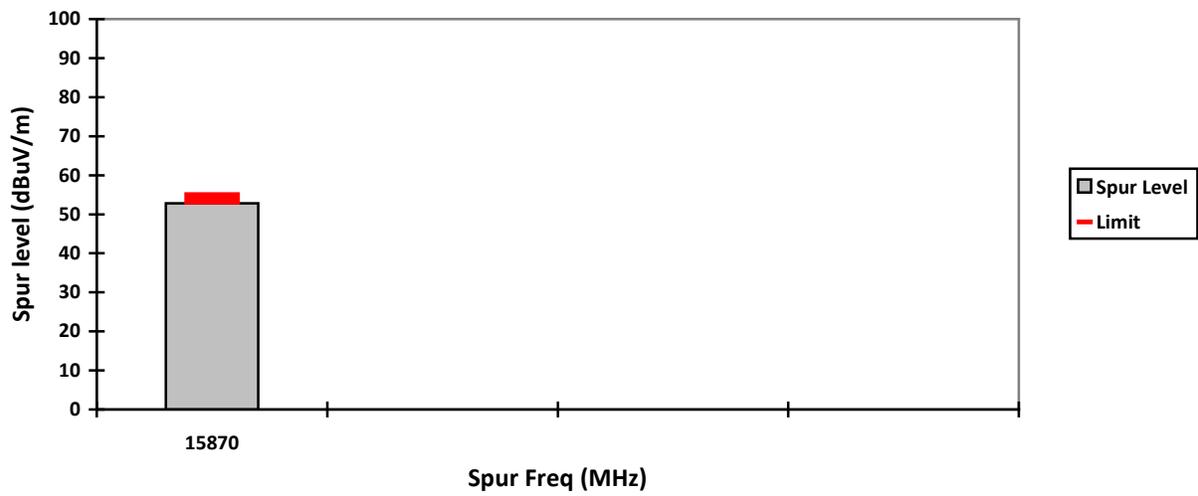
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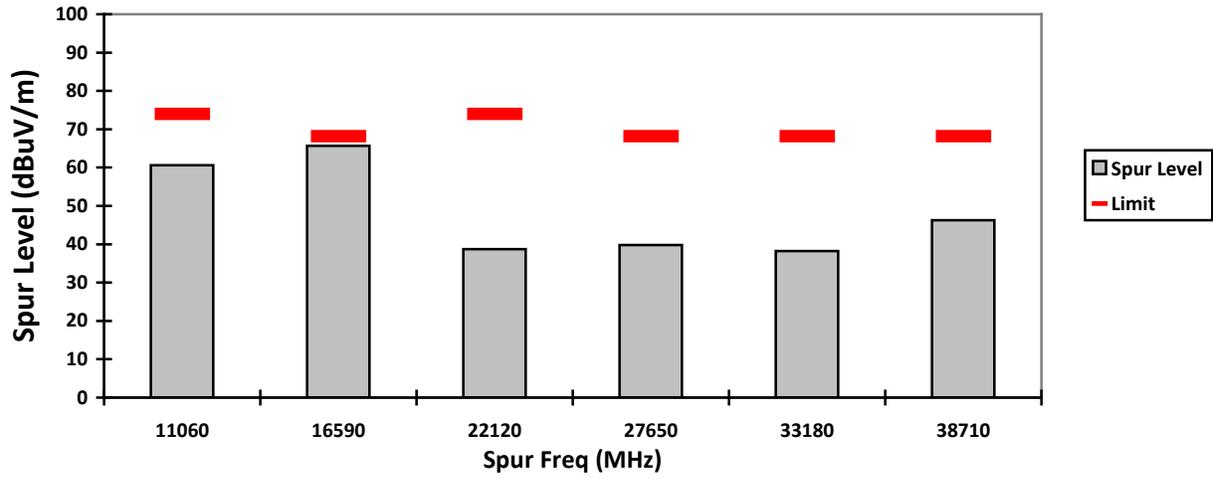
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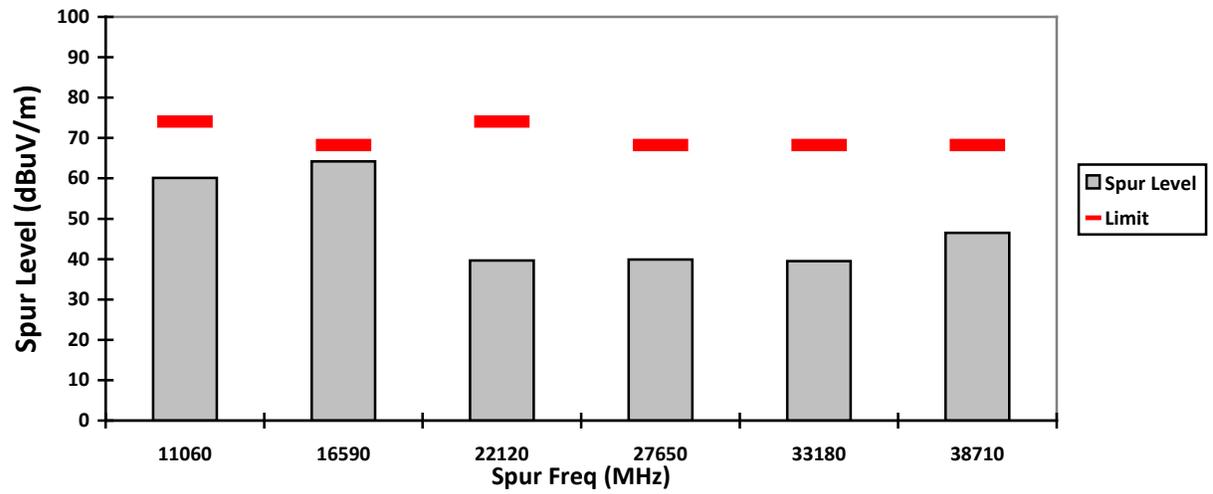
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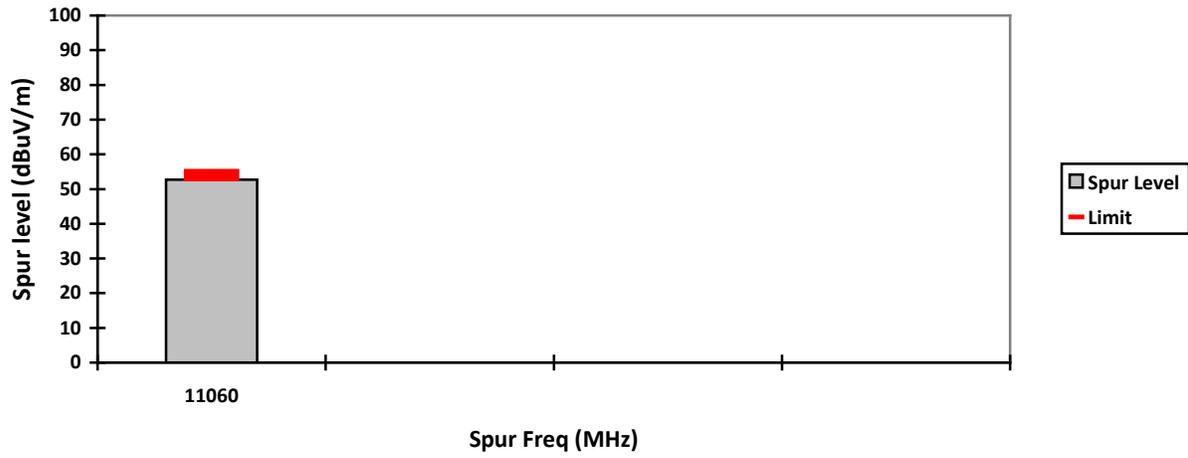
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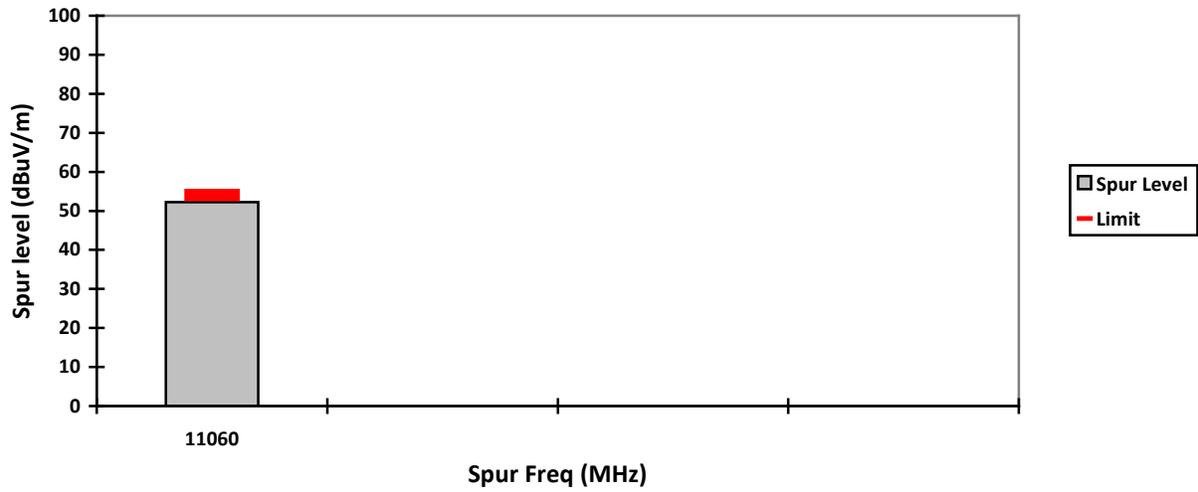
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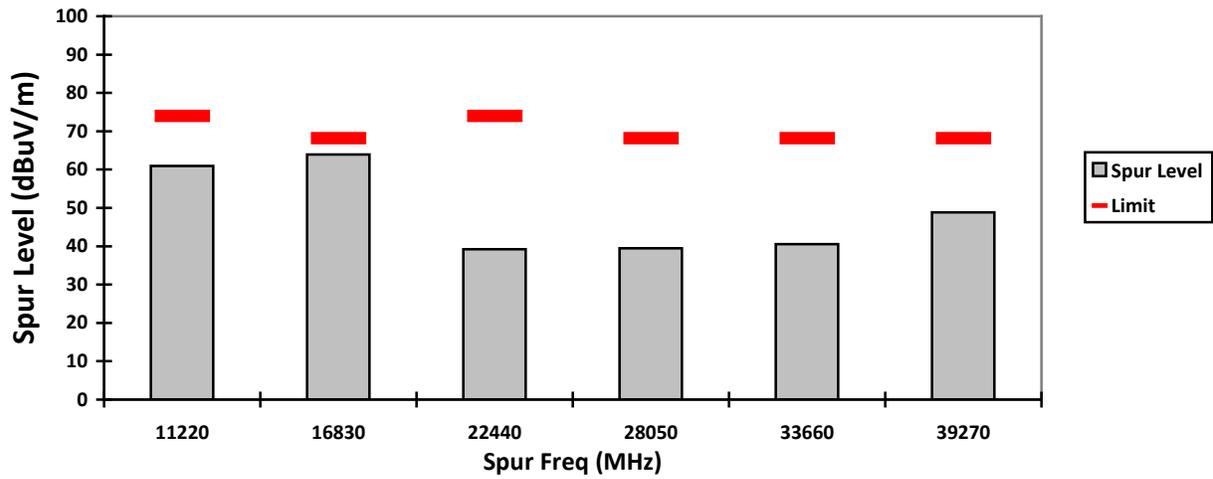
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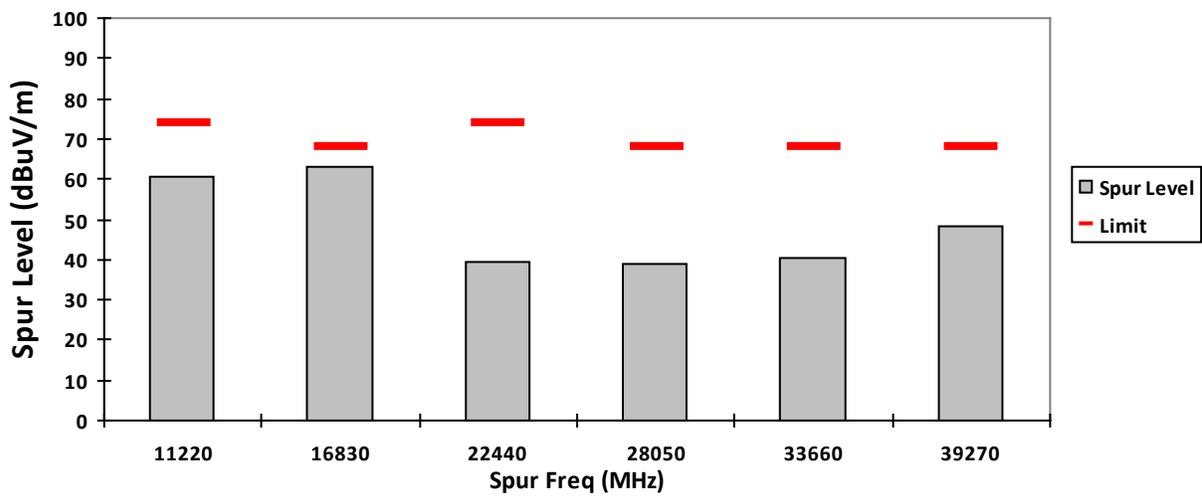
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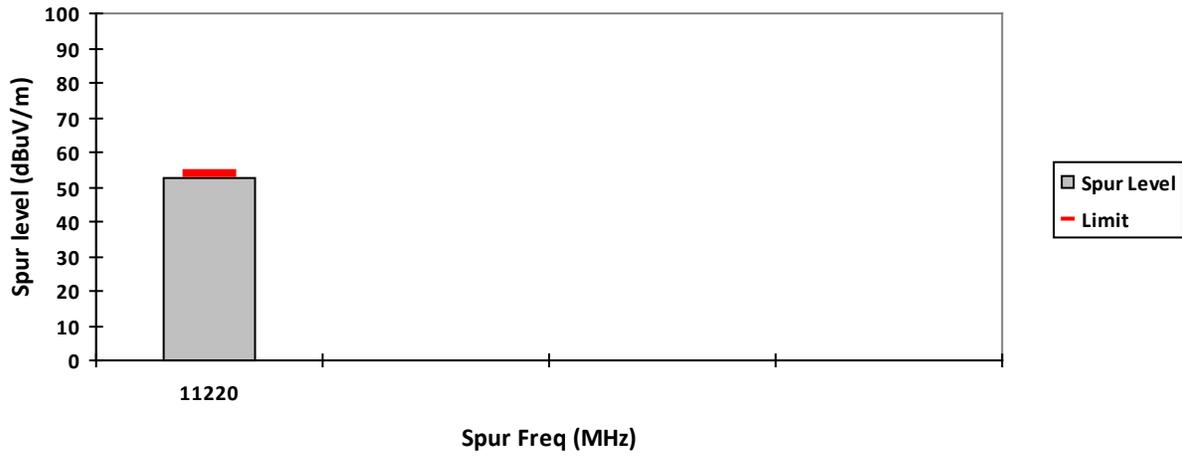
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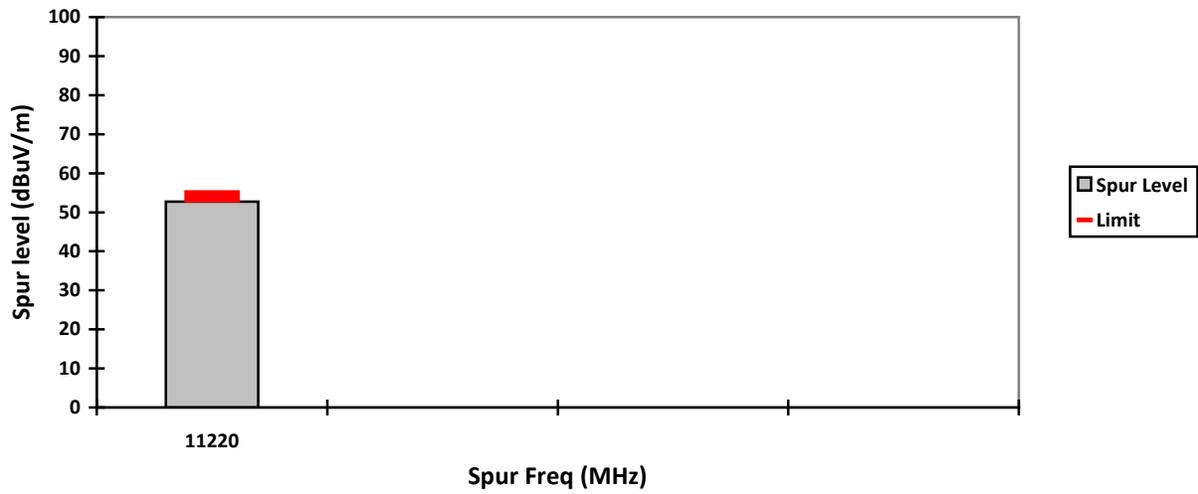
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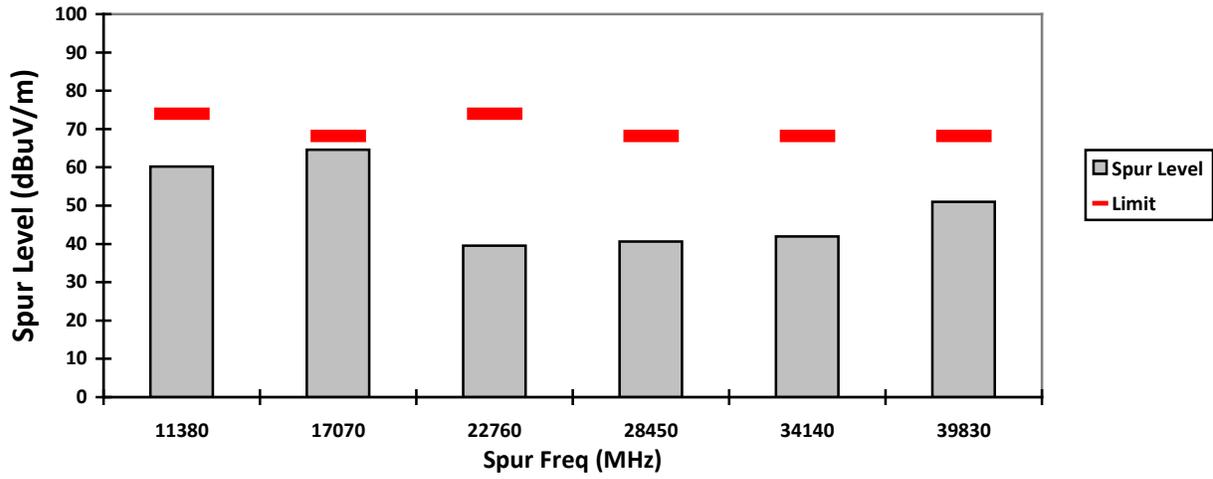
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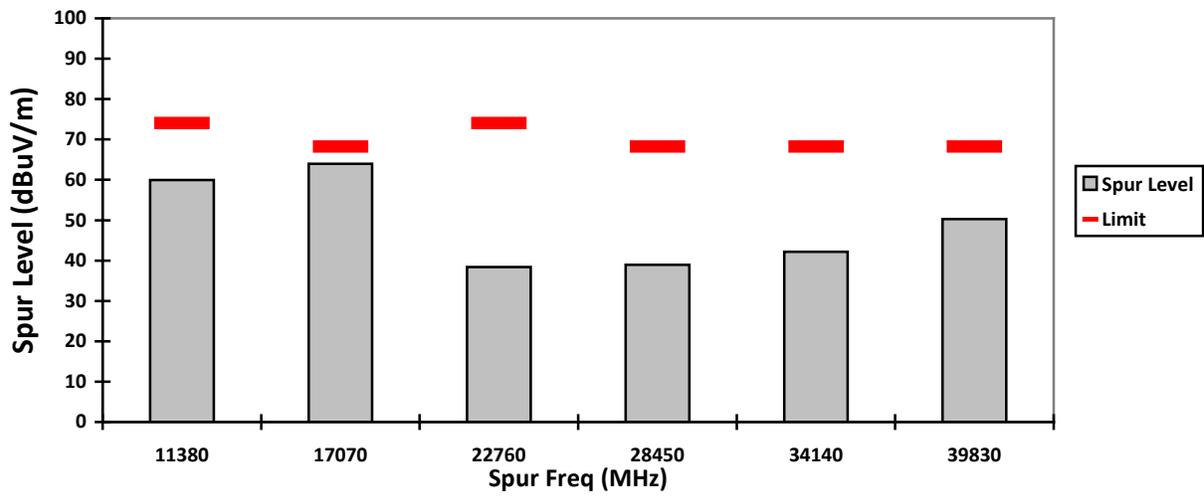
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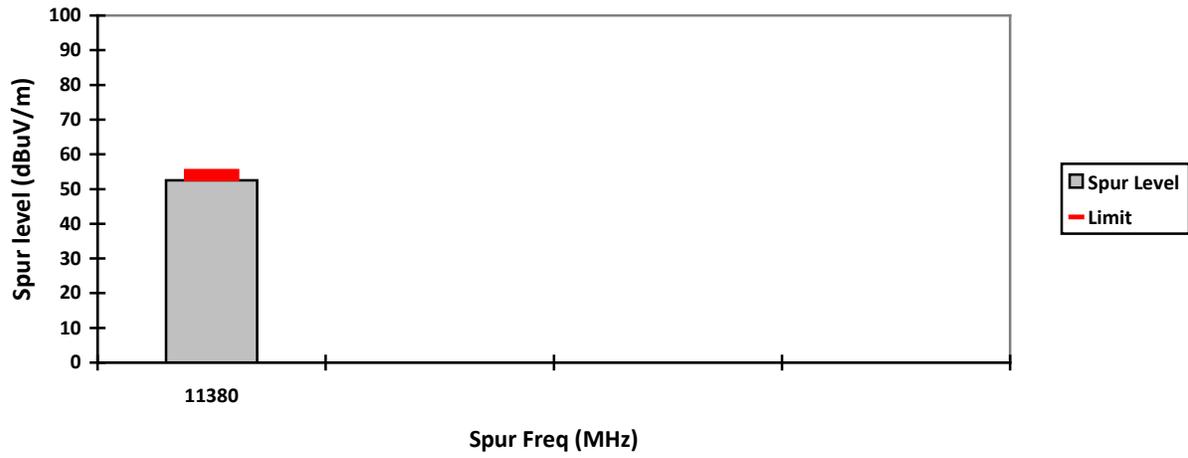
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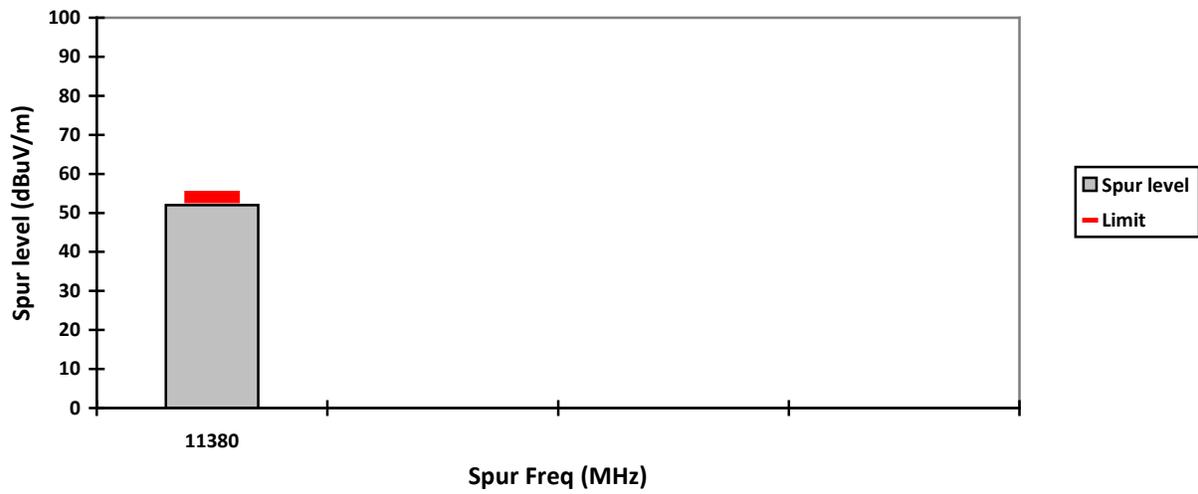
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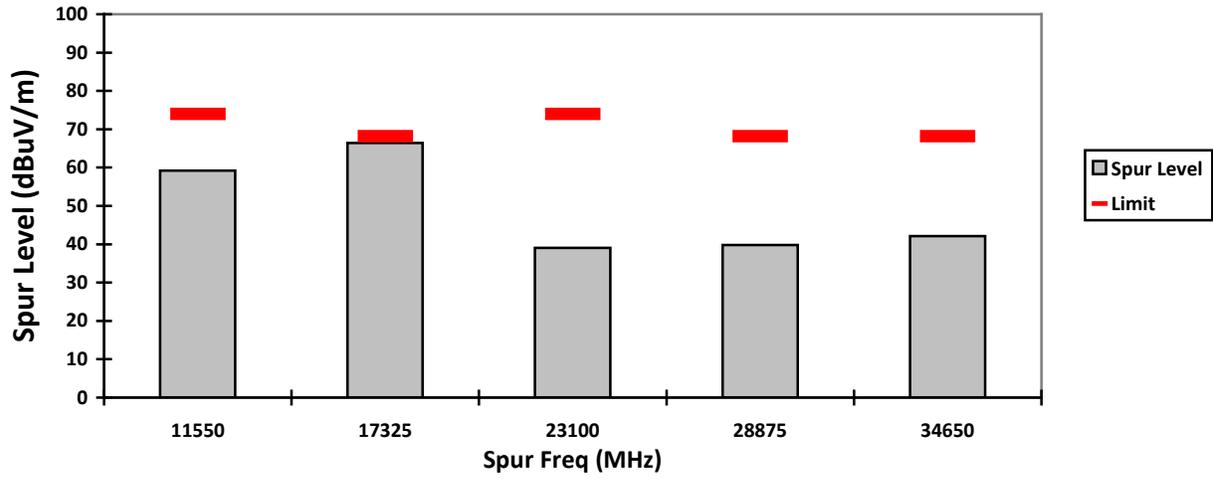
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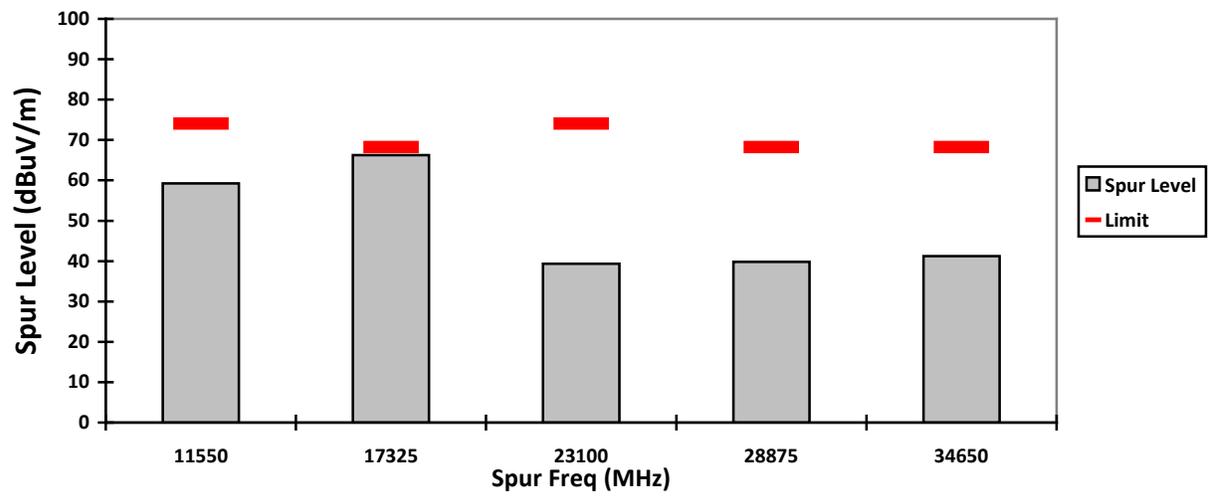
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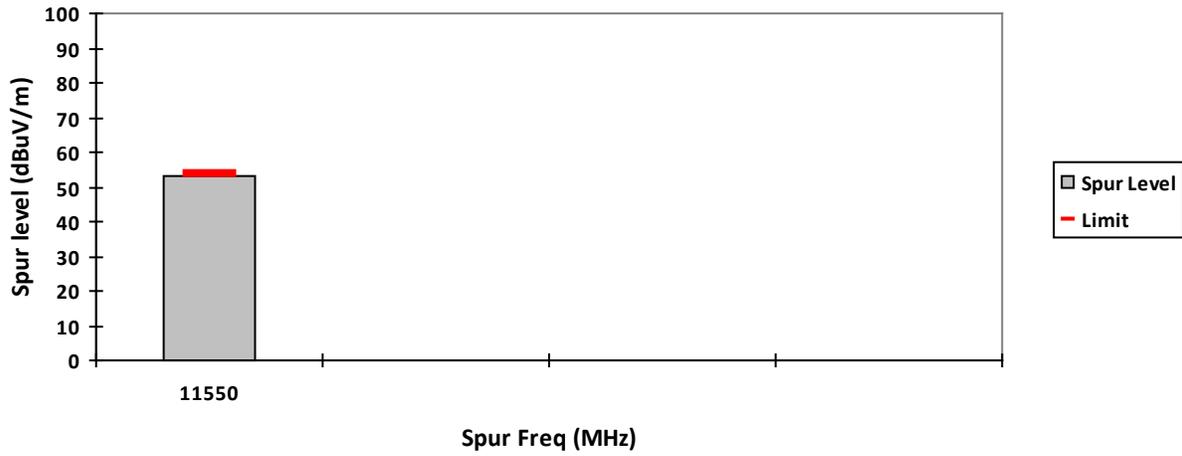
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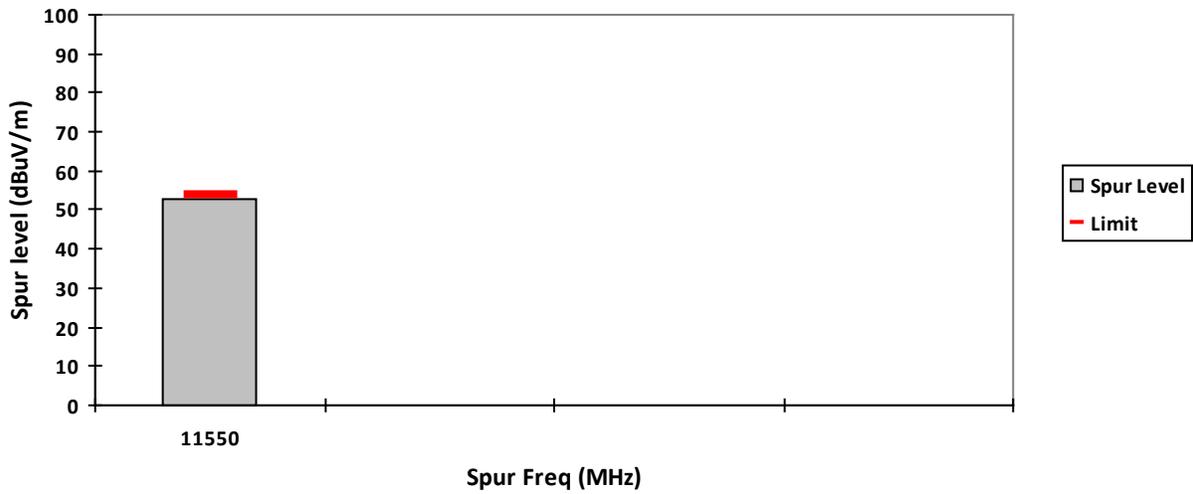
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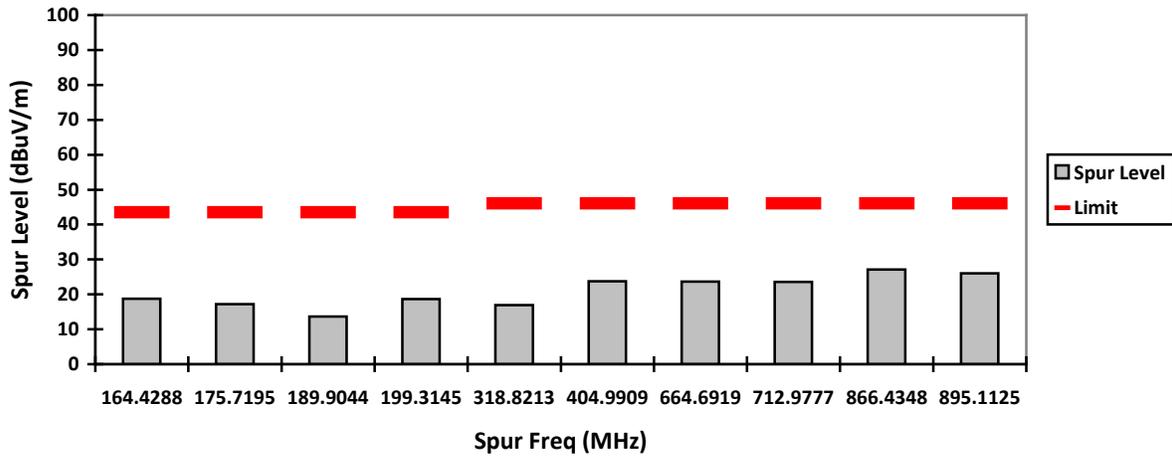
VERTICAL, AV



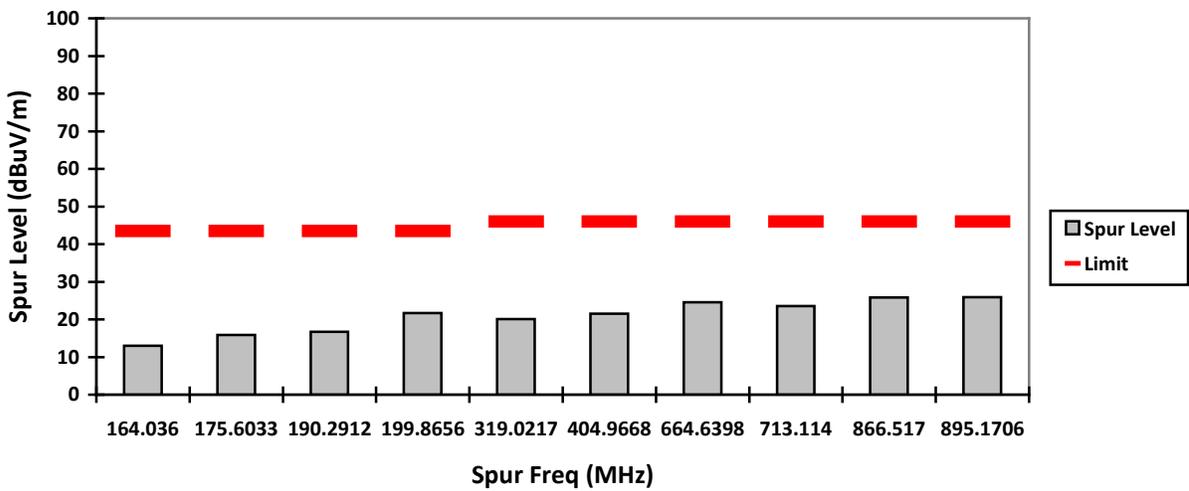
HORIZONTAL, AV



VERTICAL, QPK

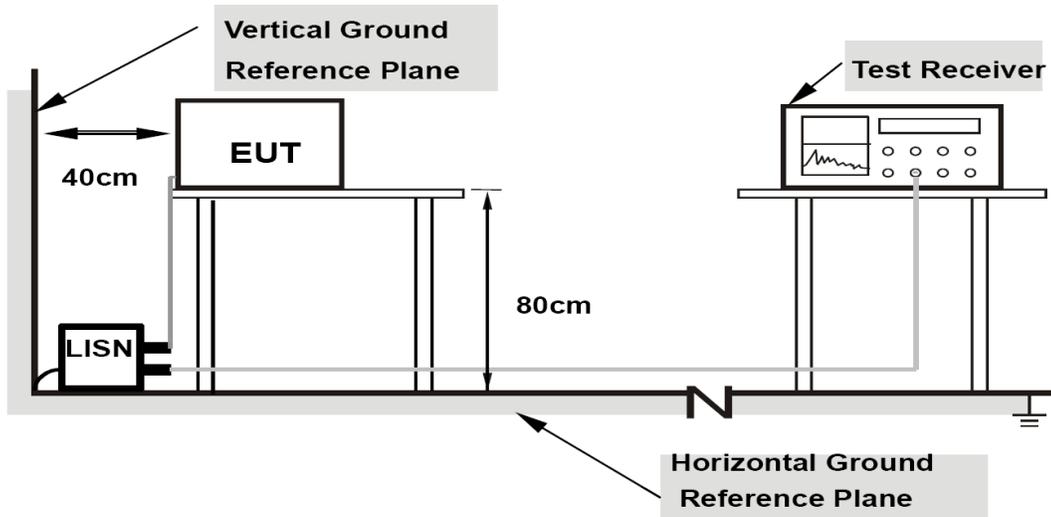


HORIZONTAL, QPK



6.8. AC Powerline Conducted Emission

6.8.1. Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.8.2. Test Limits

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports
of class A ITE

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60

NOTE The lower limit shall apply at the transition frequency.

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
 of class B ITE**

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

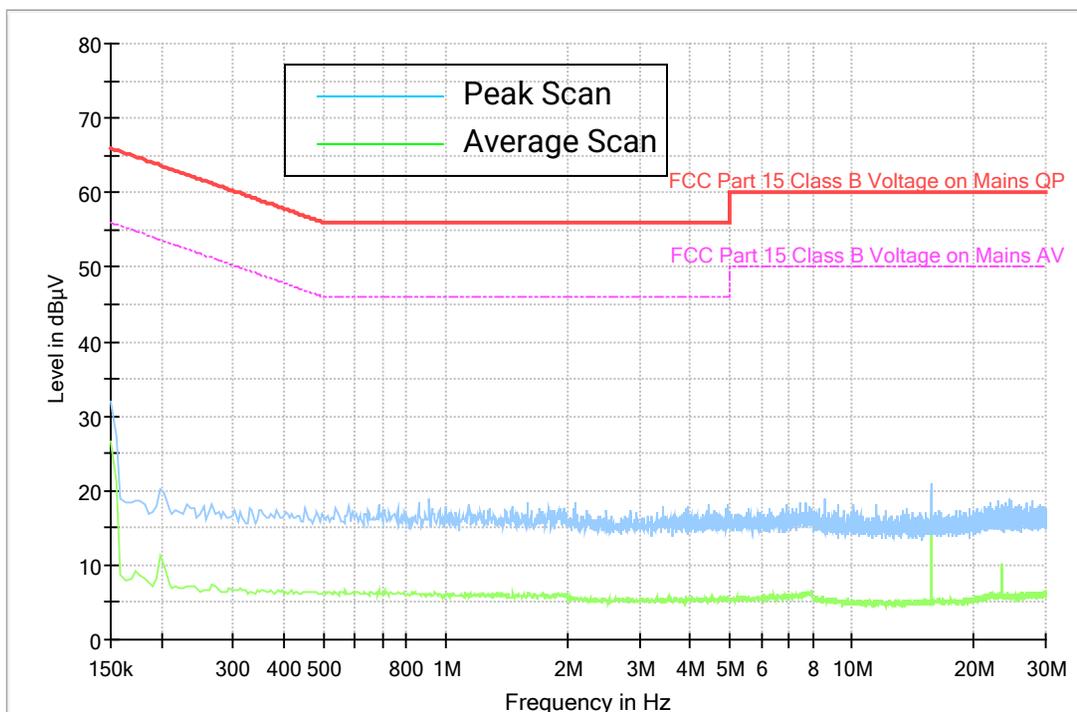
NOTE 1 The lower limit shall apply at the transition frequencies.
 NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

6.8.3. Test Data

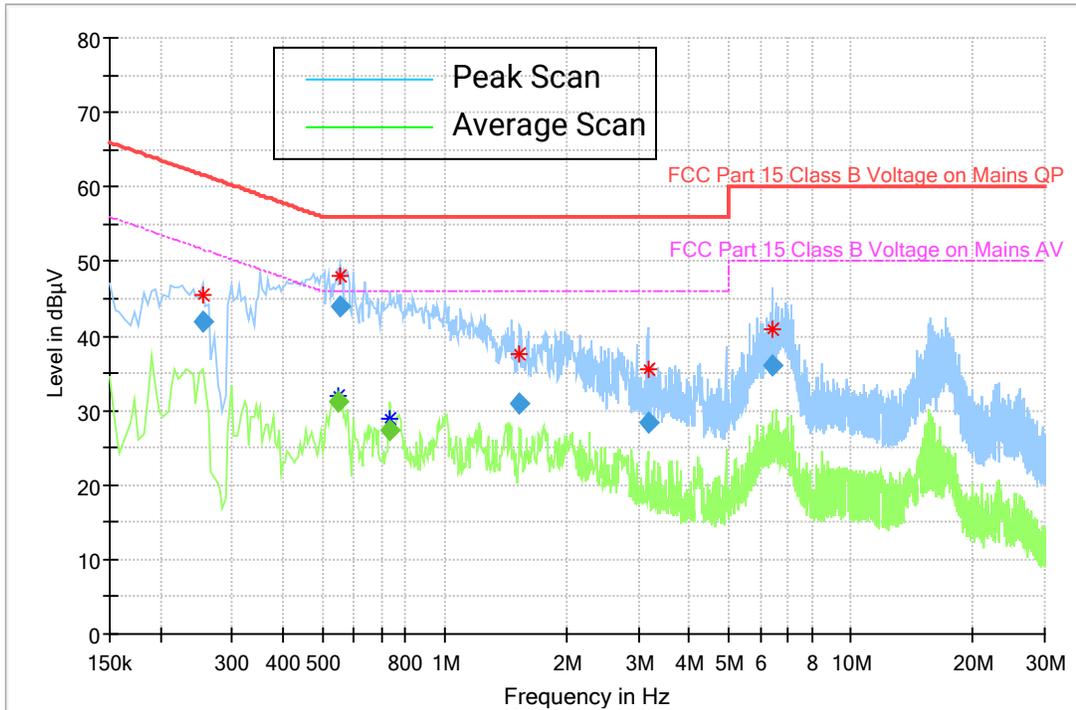
120 VAC, 60Hz
 1) Ambient

Full Spectrum



2) Ambient Laptop

Full Spectrum

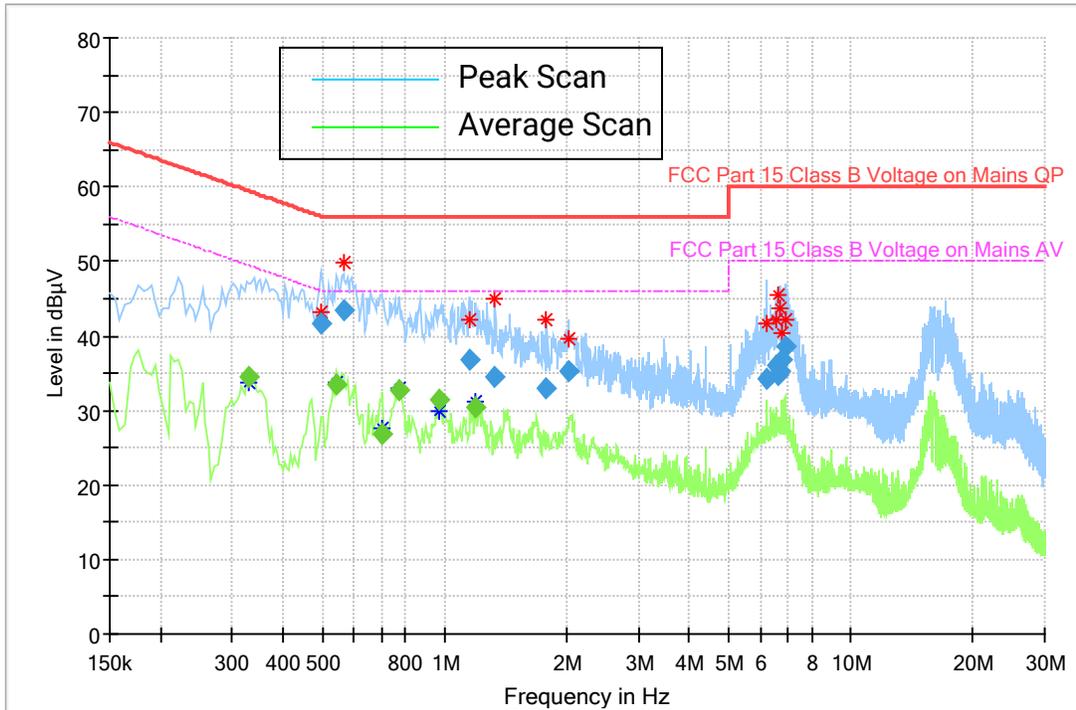


QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.253500	42.01	---	61.64	19.63	N	ON	10.2
0.550500	---	31.27	46.00	14.73	N	ON	10.6
0.555000	44.04	---	56.00	11.96	N	ON	10.6
0.735000	---	27.45	46.00	18.55	N	ON	10.5
1.531500	30.99	---	56.00	25.01	L1	ON	10.3
3.165000	28.30	---	56.00	27.70	L1	ON	10.3
6.418500	35.99	---	60.00	24.01	N	ON	10.4

3) Laptop + VRSM Standby

Full Spectrum

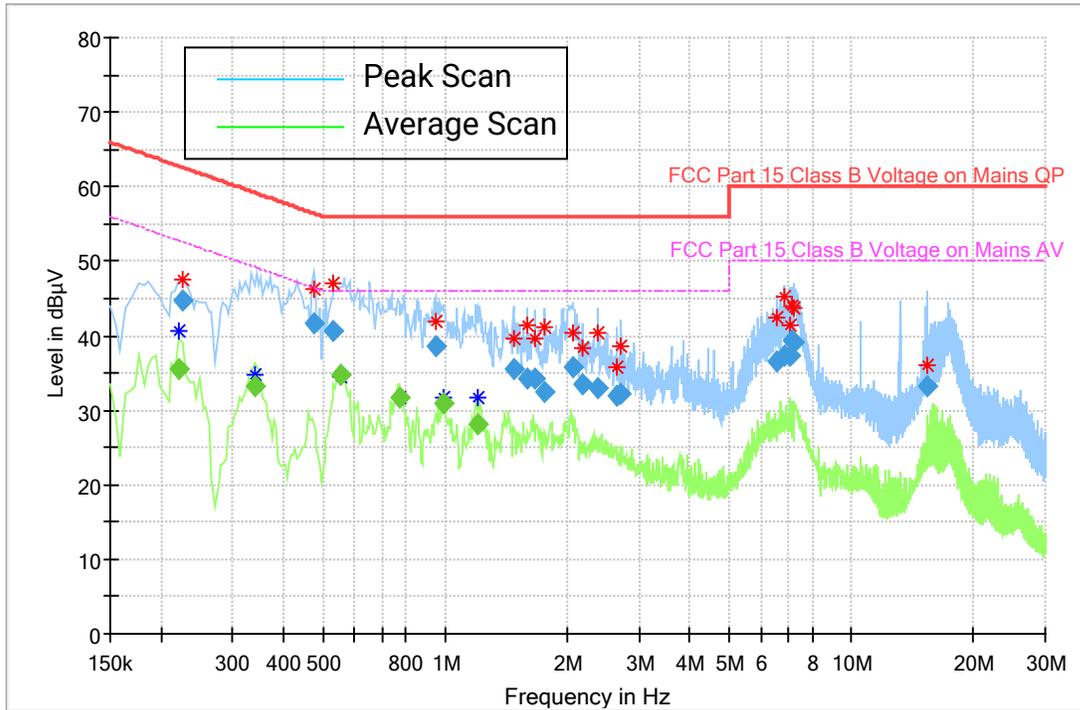


QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.330000	---	34.44	49.45	15.01	N	ON	10.5
0.496500	41.59	---	56.06	14.46	N	ON	10.6
0.541500	---	33.55	46.00	12.45	L1	ON	10.6
0.564000	43.49	---	56.00	12.51	N	ON	10.6
0.703500	---	26.73	46.00	19.27	L1	ON	10.5
0.771000	---	32.80	46.00	13.20	N	ON	10.5
0.973500	---	31.47	46.00	14.53	N	ON	10.4
1.149000	36.86	---	56.00	19.14	N	ON	10.4
1.194000	---	30.31	46.00	15.69	L1	ON	10.4
1.333500	34.61	---	56.00	21.39	N	ON	10.3
1.783500	33.00	---	56.00	23.00	L1	ON	10.3
2.017500	35.15	---	56.00	20.85	L1	ON	10.3
6.180000	34.30	---	60.00	25.70	N	ON	10.4
6.571500	36.13	---	60.00	23.87	L1	ON	10.4
6.616500	34.87	---	60.00	25.13	N	ON	10.4
6.706500	35.31	---	60.00	24.69	N	ON	10.4
6.778500	36.85	---	60.00	23.15	L1	ON	10.4
6.882000	38.58	---	60.00	21.42	L1	ON	10.4

4) Laptop + VRSM TX WiFi 5GHz 802.11a

Full Spectrum



QuasiPeak and Average Measurement

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Line	Filter	Corr. (dB)
0.222000	---	35.56	52.74	17.18	L1	ON	10.4
0.226500	44.71	---	62.58	17.86	L1	ON	10.3
0.339000	---	33.24	49.23	15.99	N	ON	10.5
0.474000	41.68	---	56.44	14.77	N	ON	10.6
0.532500	40.53	---	56.00	15.47	L1	ON	10.6
0.555000	---	34.84	46.00	11.16	N	ON	10.6
0.771000	---	31.61	46.00	14.39	L1	ON	10.5
0.946500	38.63	---	56.00	17.37	N	ON	10.4
0.991500	---	30.87	46.00	15.13	N	ON	10.4
1.198500	---	28.05	46.00	17.95	N	ON	10.3
1.473000	35.62	---	56.00	20.38	L1	ON	10.3
1.590000	34.31	---	56.00	21.69	L1	ON	10.3
1.666500	34.32	---	56.00	21.68	L1	ON	10.3
1.765500	32.41	---	56.00	23.59	L1	ON	10.3
2.067000	35.76	---	56.00	20.24	L1	ON	10.3
2.175000	33.58	---	56.00	22.42	N	ON	10.3
2.382000	32.96	---	56.00	23.04	L1	ON	10.3
2.643000	31.91	---	56.00	24.09	N	ON	10.3
2.710500	32.10	---	56.00	23.90	N	ON	10.3
6.585000	36.47	---	60.00	23.53	N	ON	10.4
6.828000	37.36	---	60.00	22.64	N	ON	10.4
7.066500	37.28	---	60.00	22.72	N	ON	10.4
7.152000	39.43	---	60.00	20.57	L1	ON	10.4
7.233000	39.10	---	60.00	20.90	L1	ON	10.4
15.333000	33.18	---	60.00	26.82	N	ON	10.4

END OF TEST REPORT