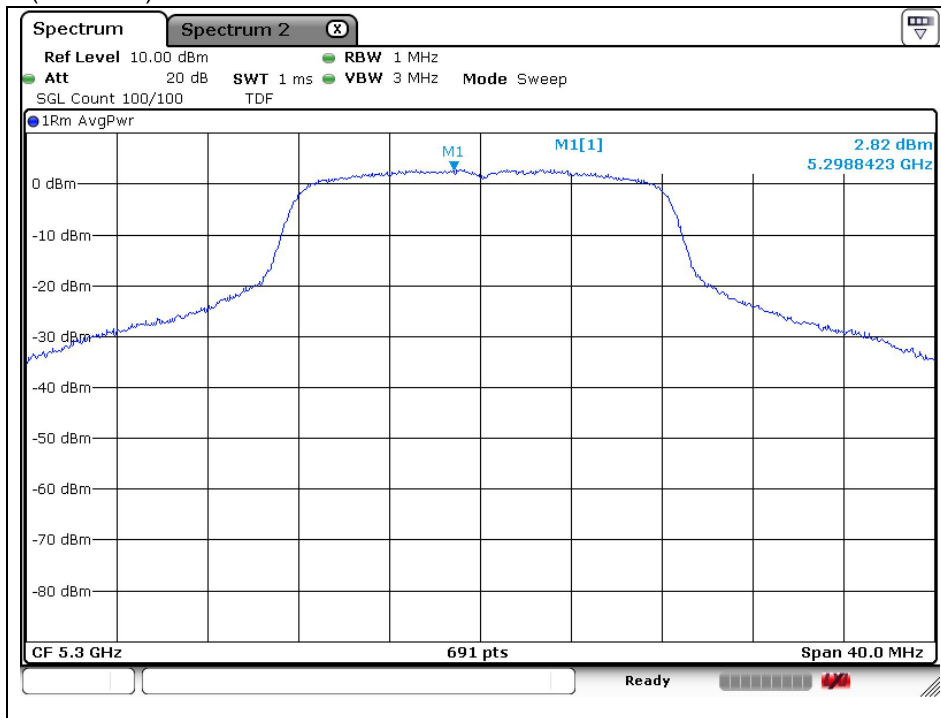
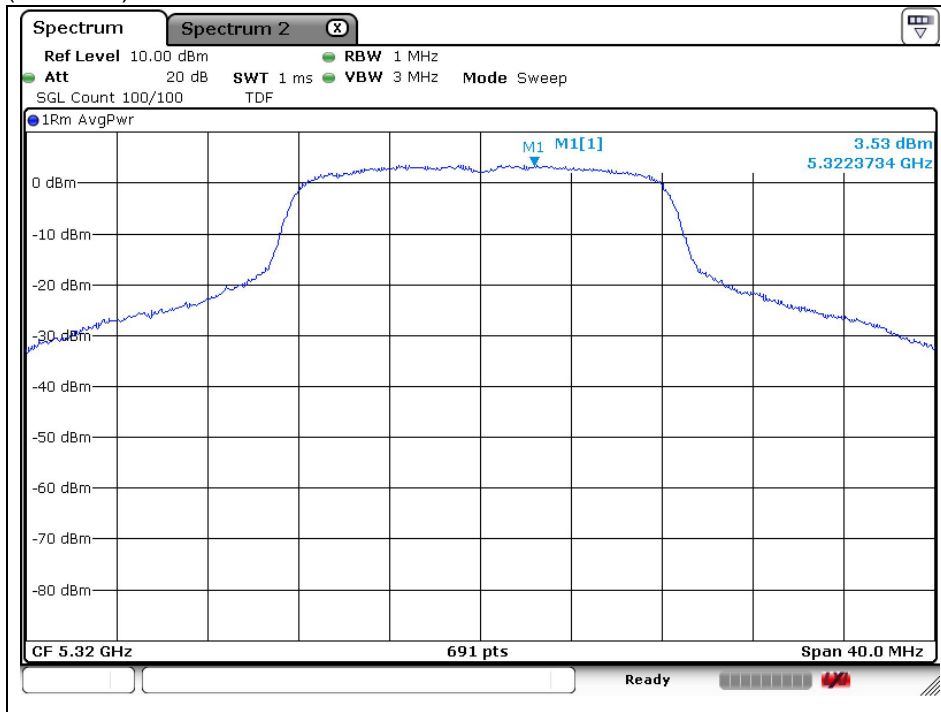


Middle Channel (5 300 MHz)



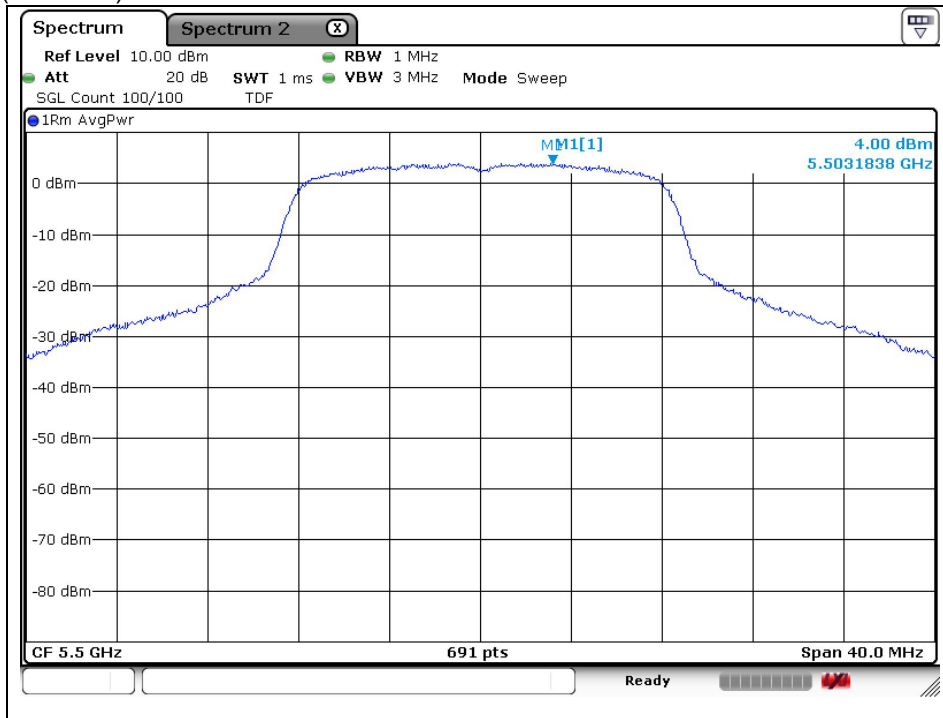
High Channel (5 320 MHz)



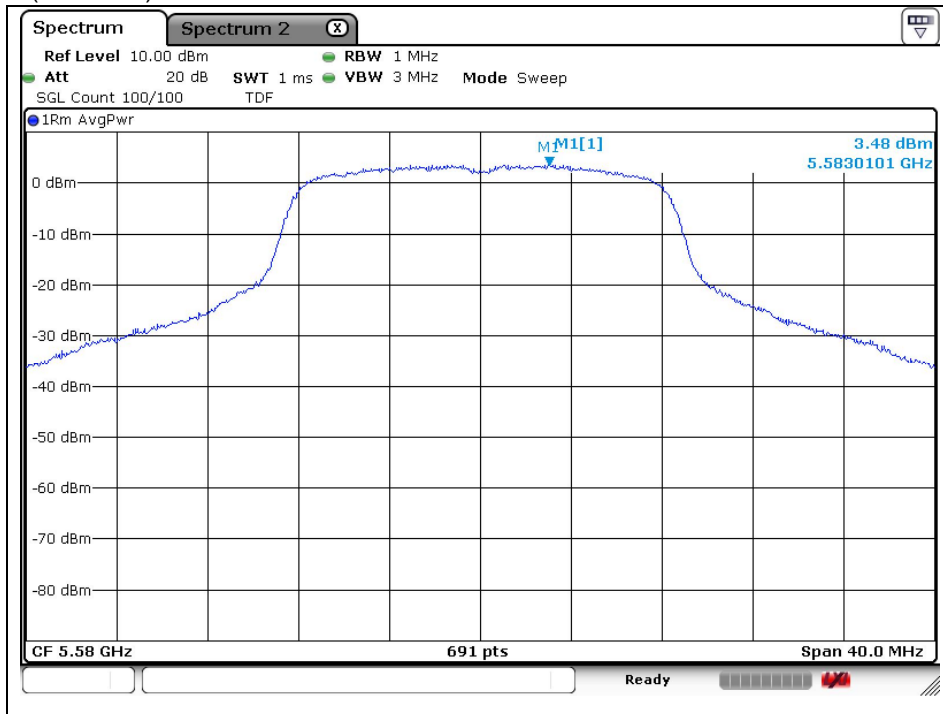
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OFDM: 802.11a (Band 2C) _ANT 2

Low Channel (5 500 MHz)



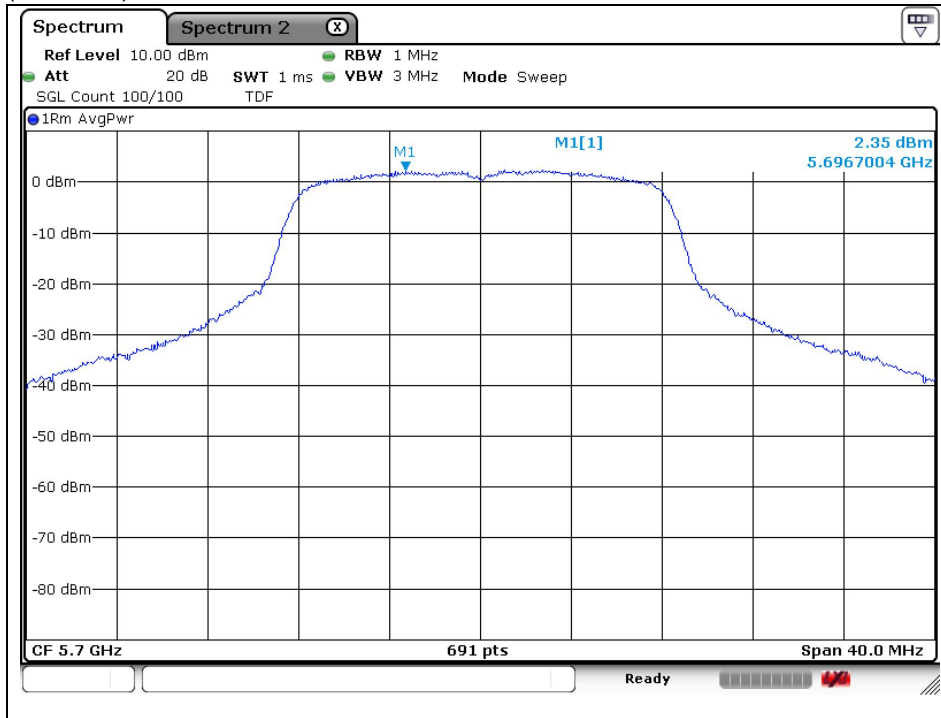
Middle Channel (5 580 MHz)



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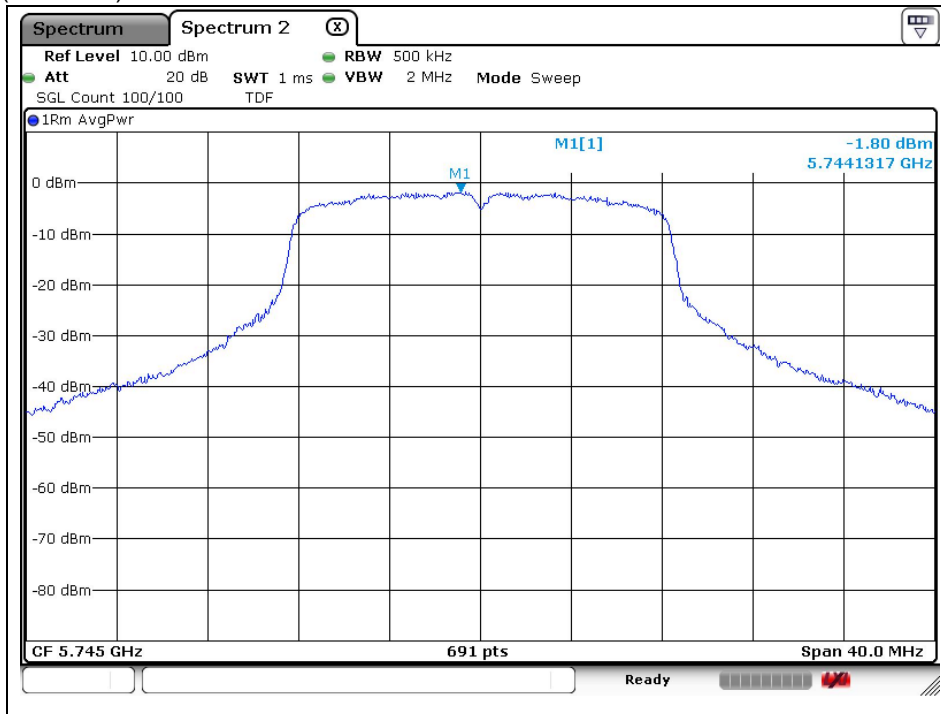
SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

High Channel (5 700 MHz)



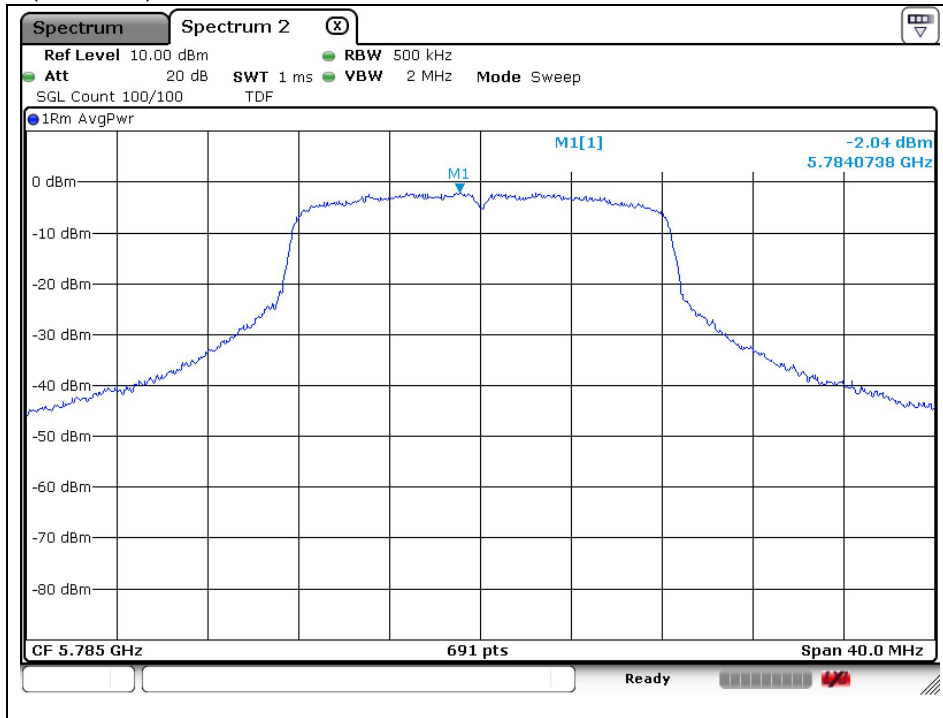
OFDM: 802.11a (Band 3) _ANT 2

Low Channel (5 745 MHz)

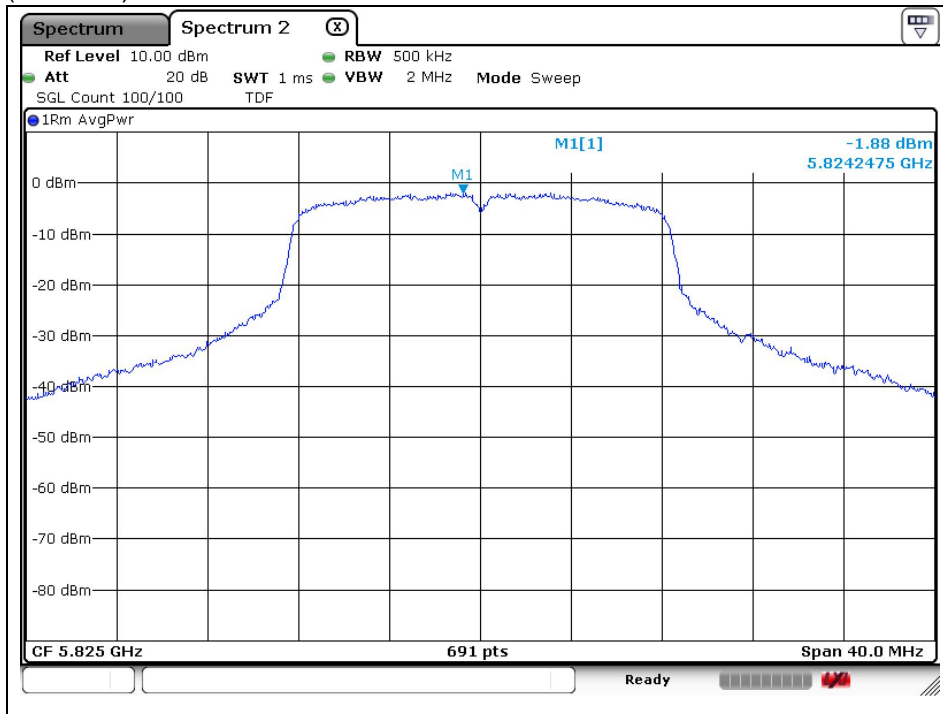


The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

Middle Channel (5 785 MHz)



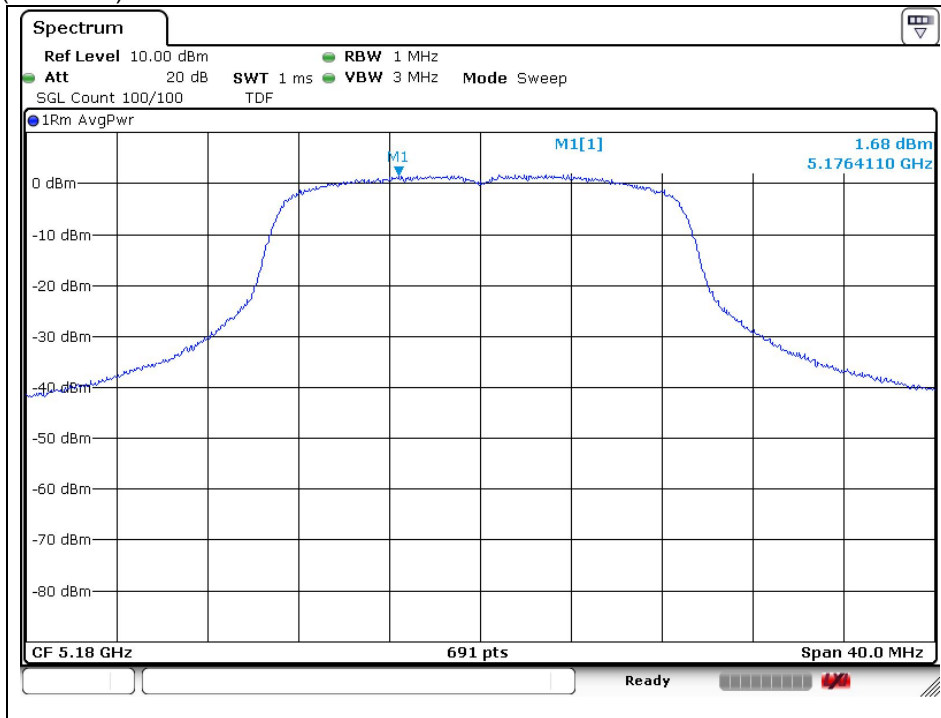
High Channel (5 825 MHz)



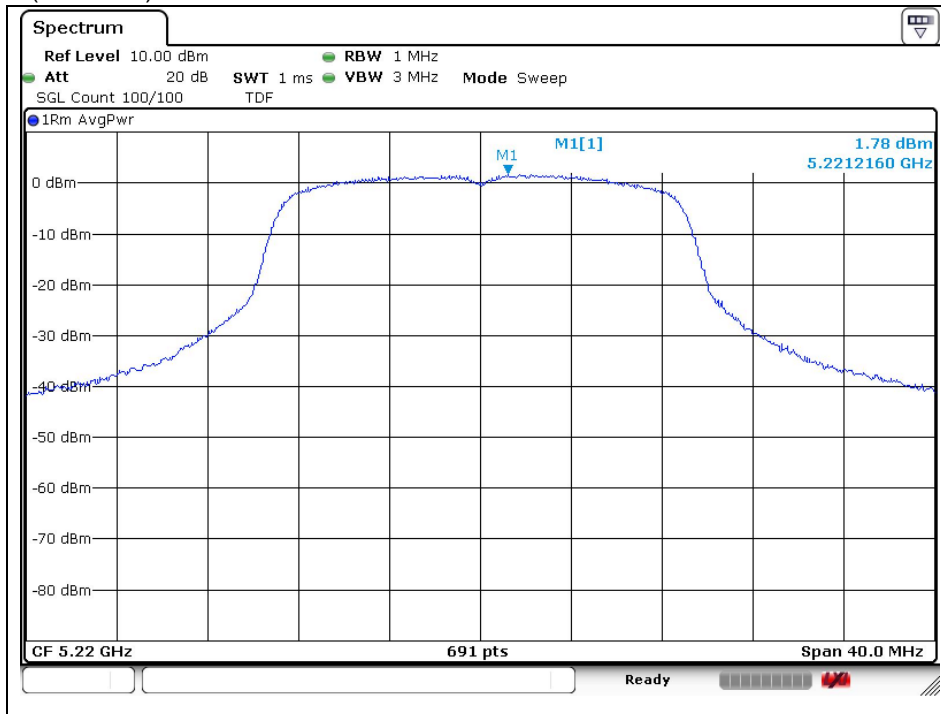
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OFDM: 802.11n_HT20 (Band 1)_ANT 1

Low Channel (5 180 MHz)

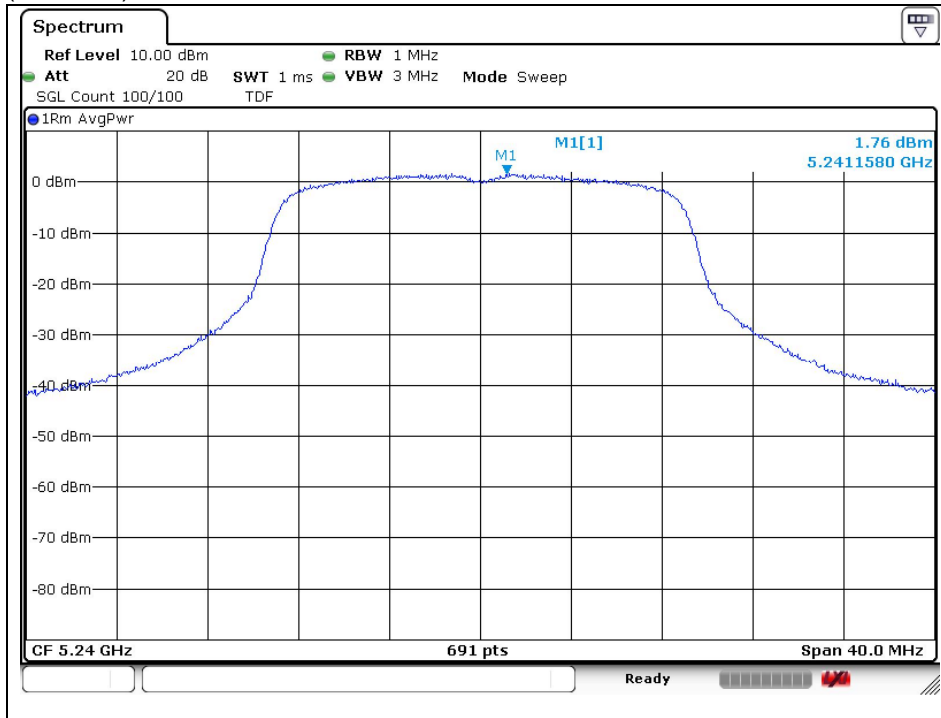


Middle Channel (5 220 MHz)



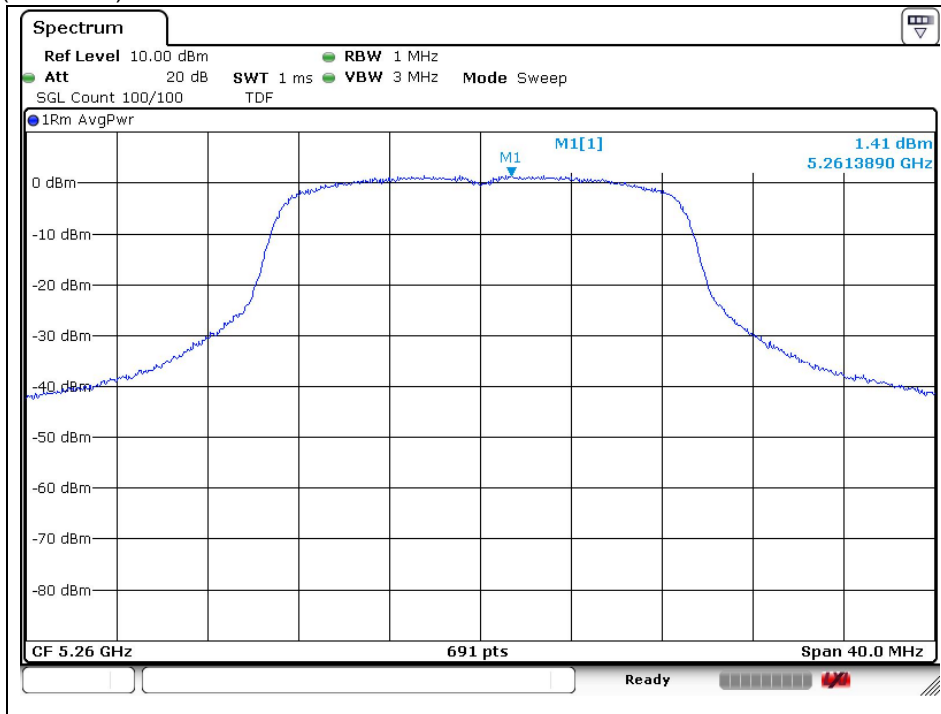
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

High Channel (5 240 MHz)



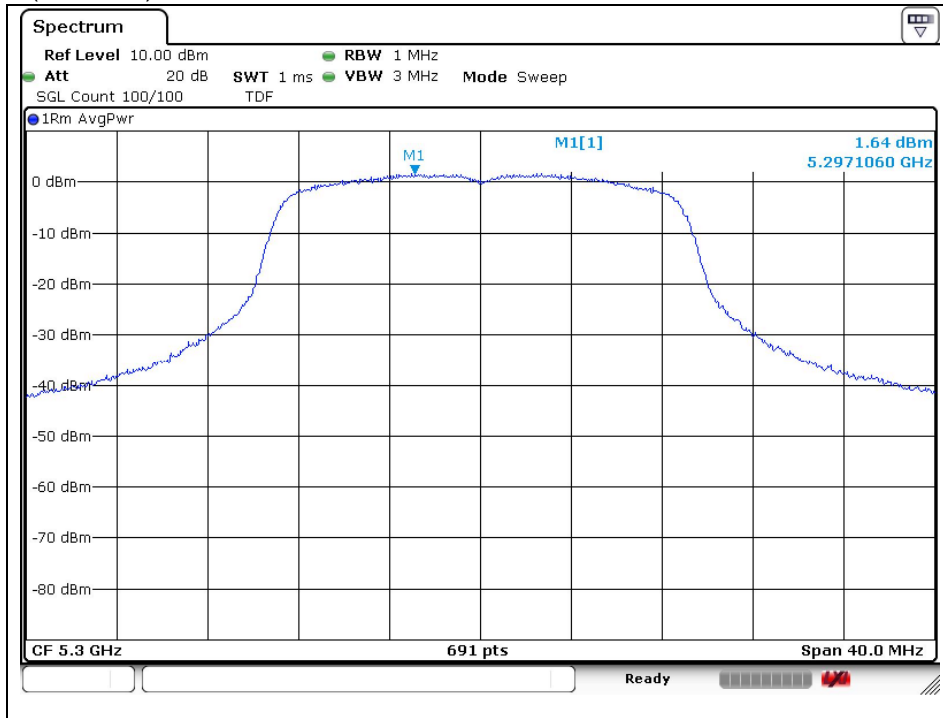
OFDM: 802.11n_HT20 (Band 2A)_ANT 1

Low Channel (5 260 MHz)

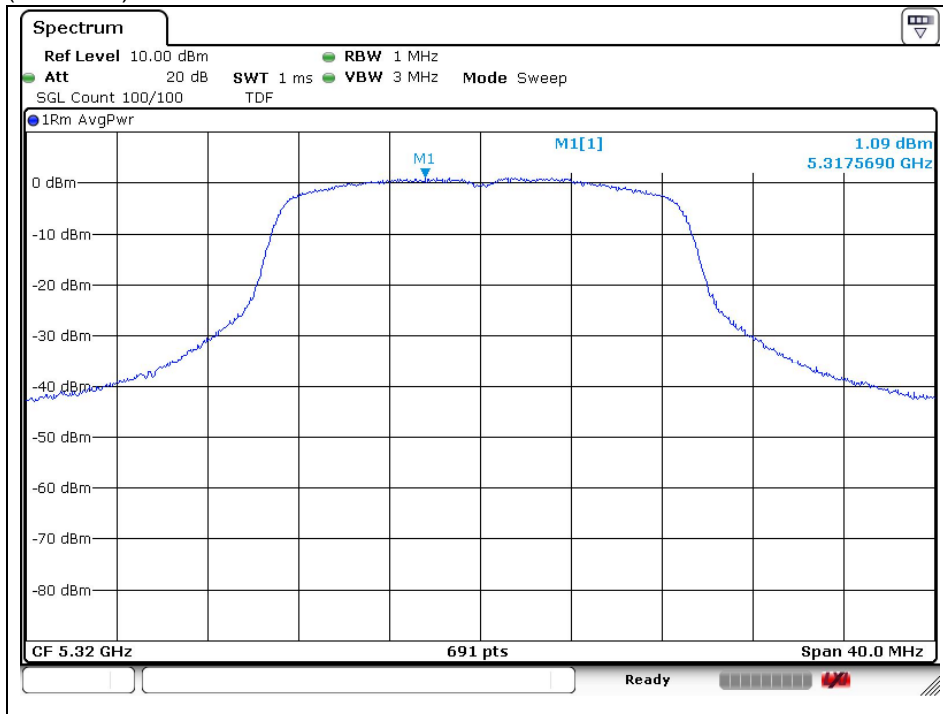


The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

Middle Channel (5 300 MHz)



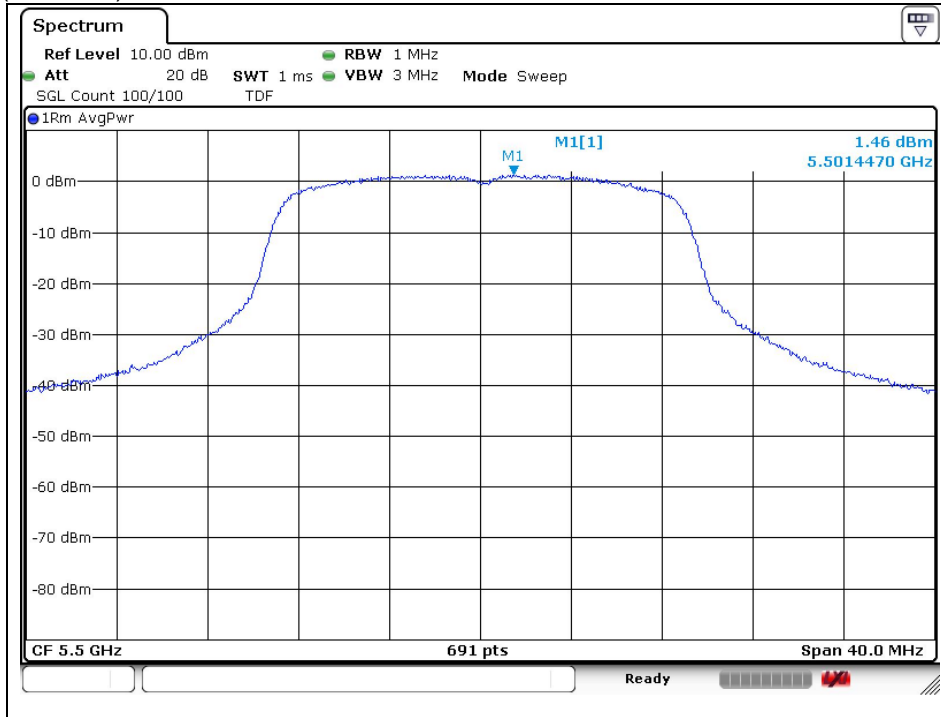
High Channel (5 320 MHz)



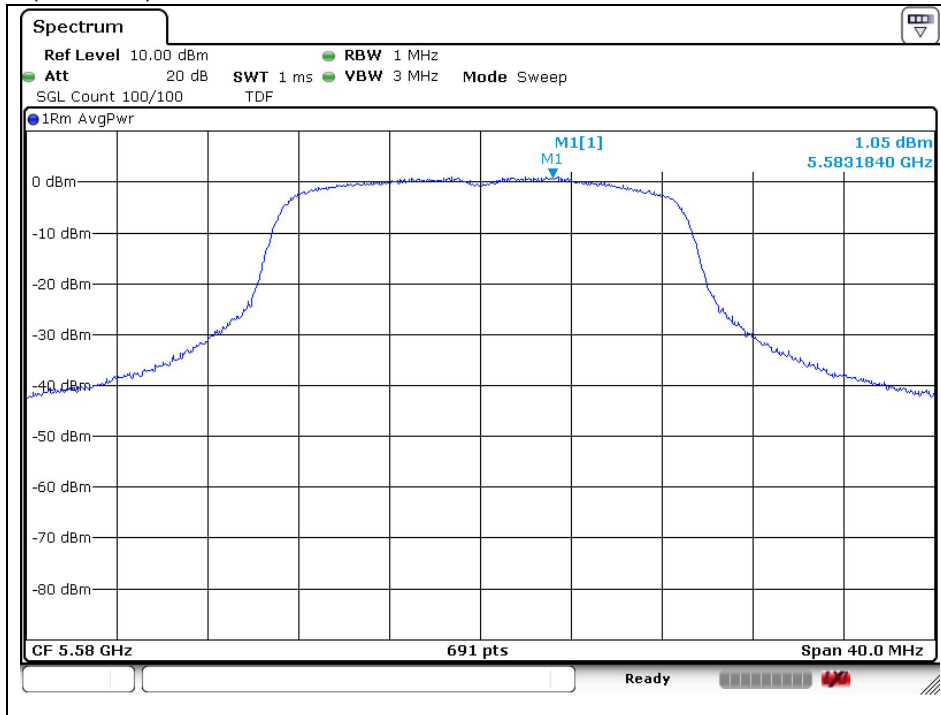
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

OFDM: 802.11n_HT20 (Band 2C)_ANT 1

Low Channel (5 500 MHz)

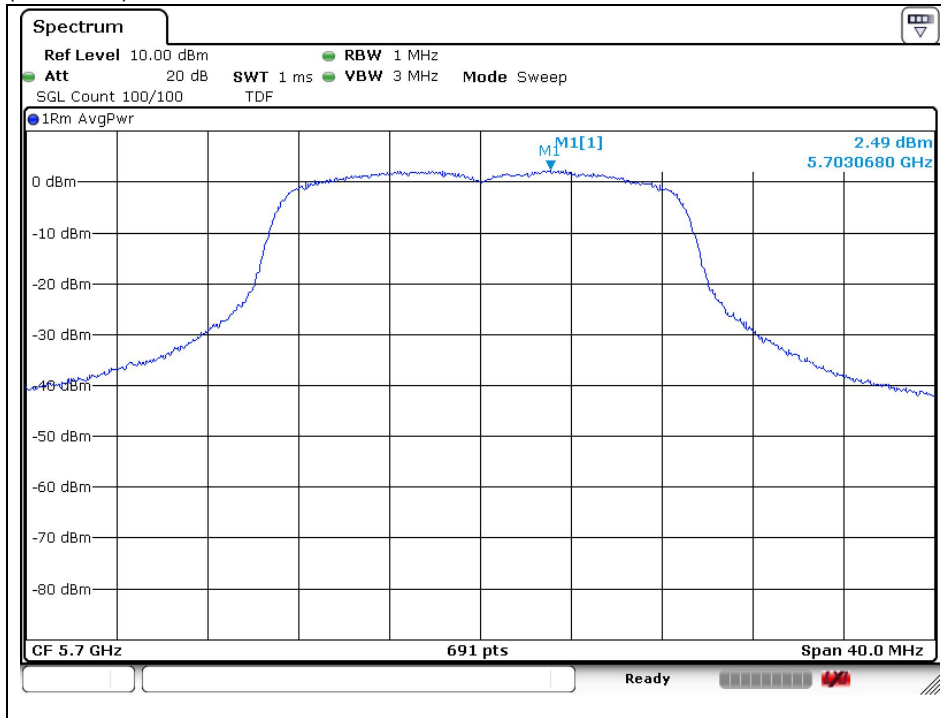


Middle Channel (5 580 MHz)



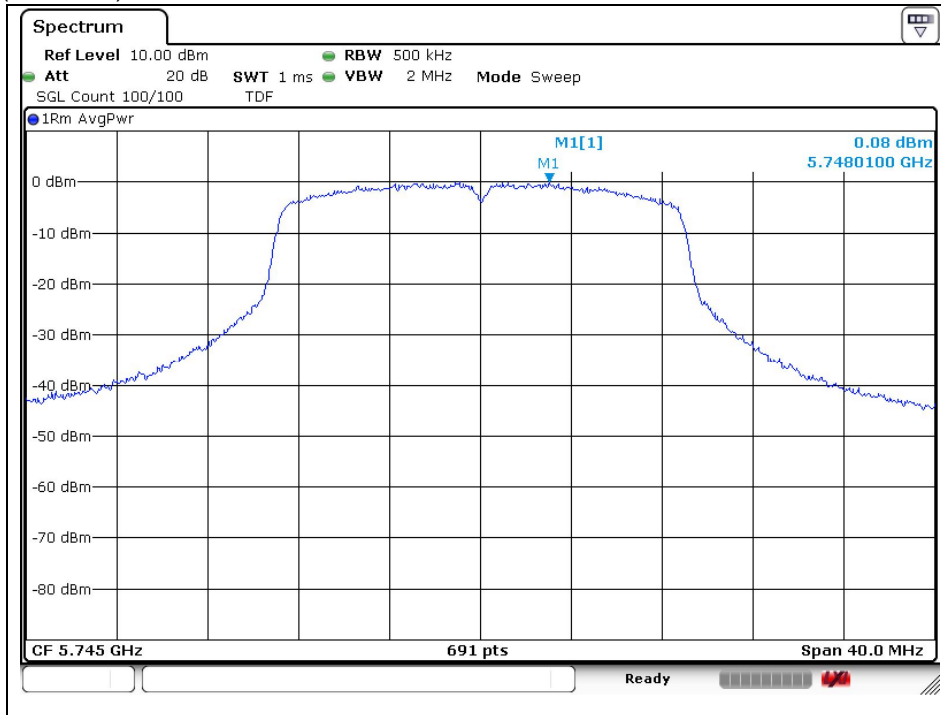
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

High Channel (5 700 MHz)



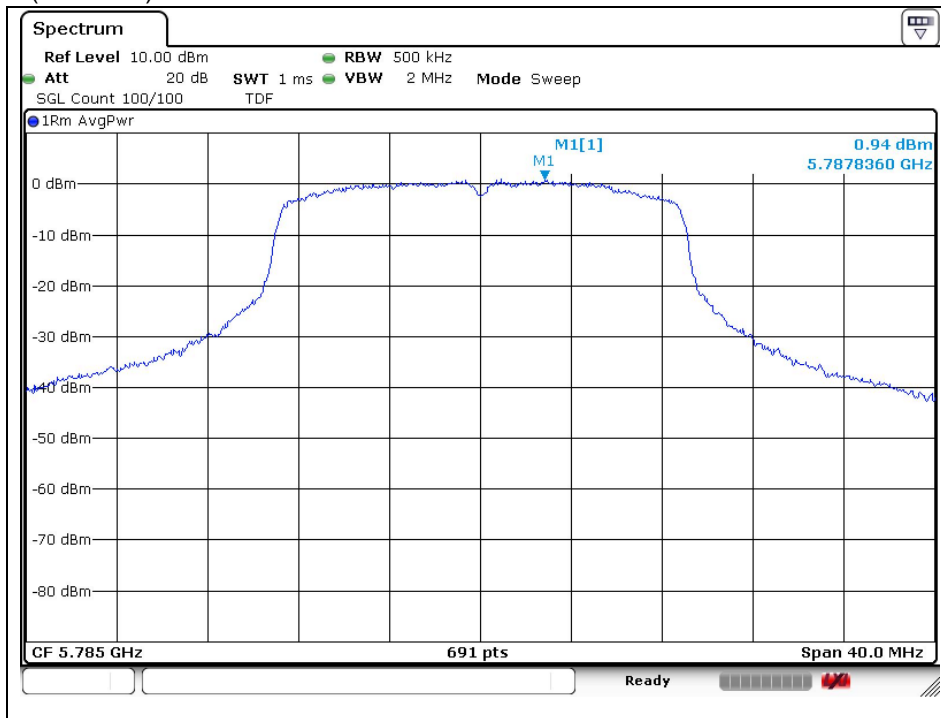
OFDM: 802.11n_HT20 (Band 3)_ANT 1

Low Channel (5 745 MHz)

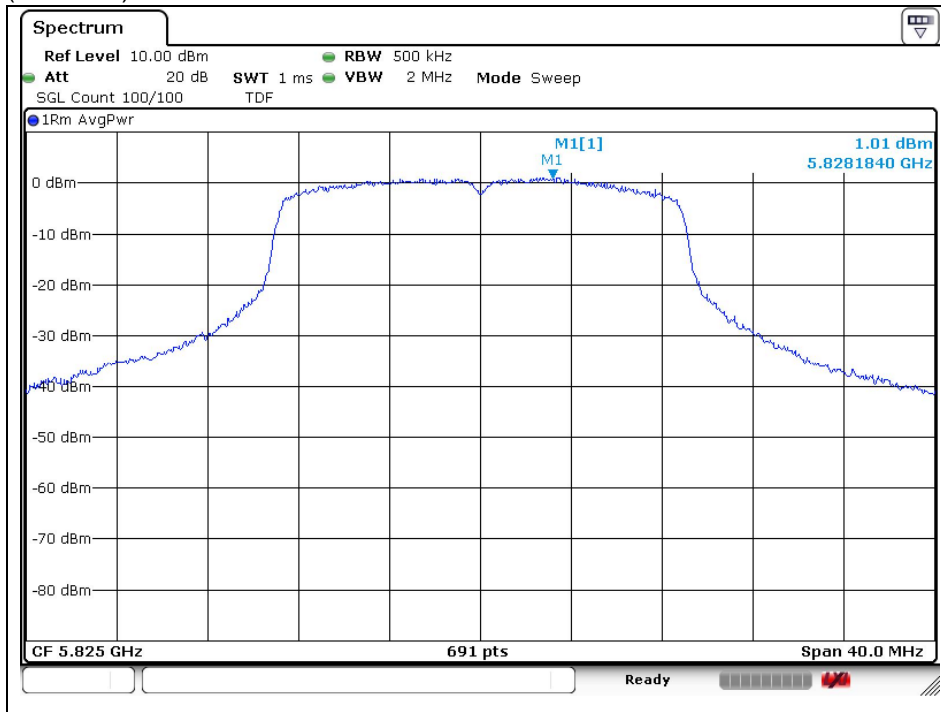


The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

Middle Channel (5 785 MHz)



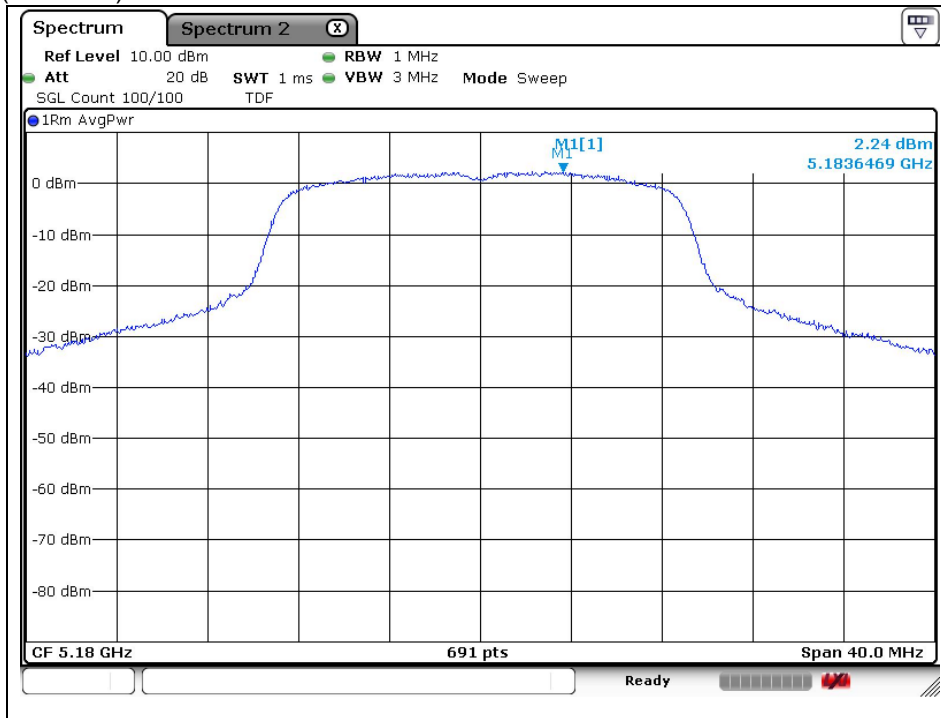
High Channel (5 825 MHz)



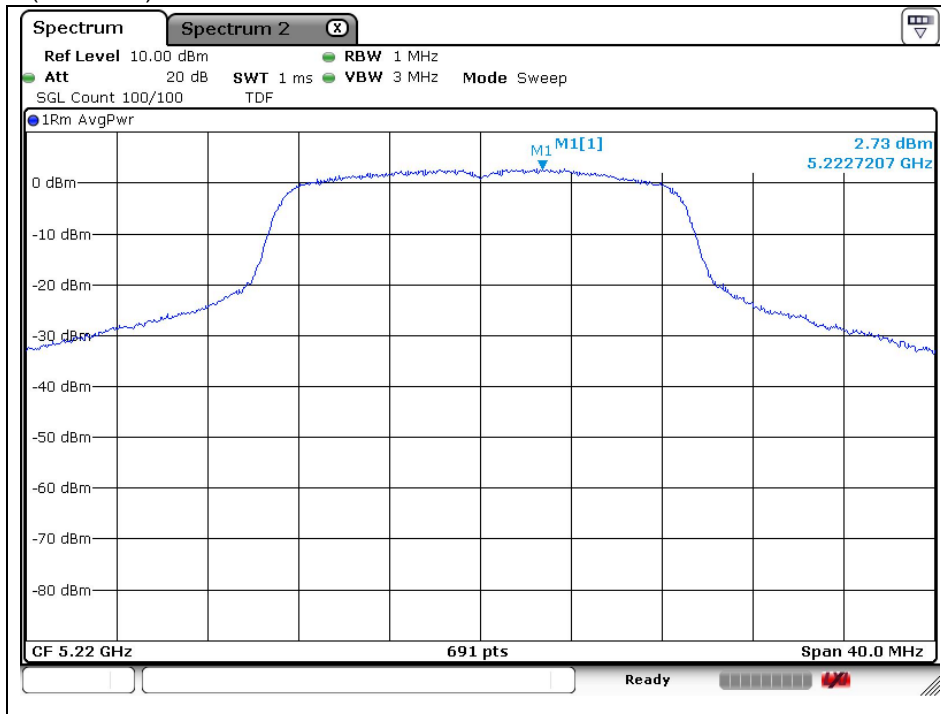
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OFDM: 802.11n_HT20 (Band 1)_ANT 2

Low Channel (5 180 MHz)

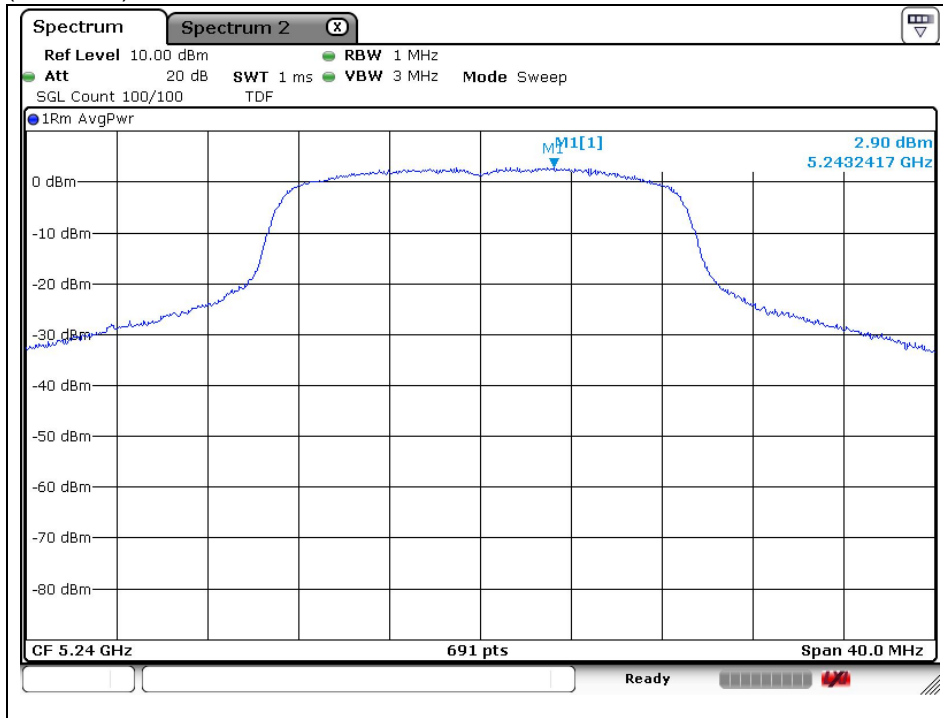


Middle Channel (5 220 MHz)



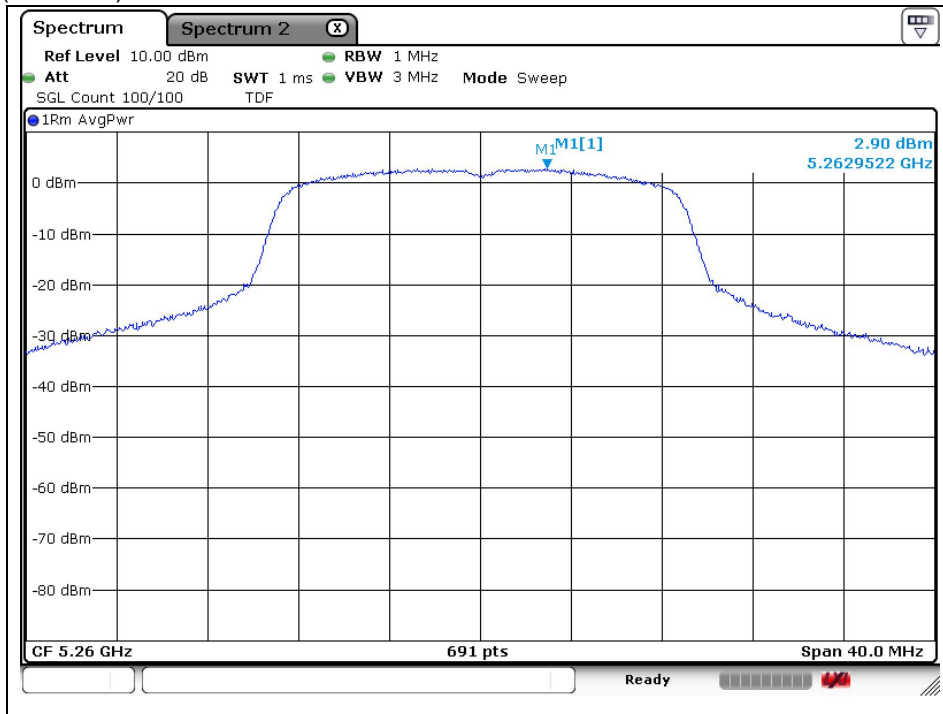
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High Channel (5 240 MHz)



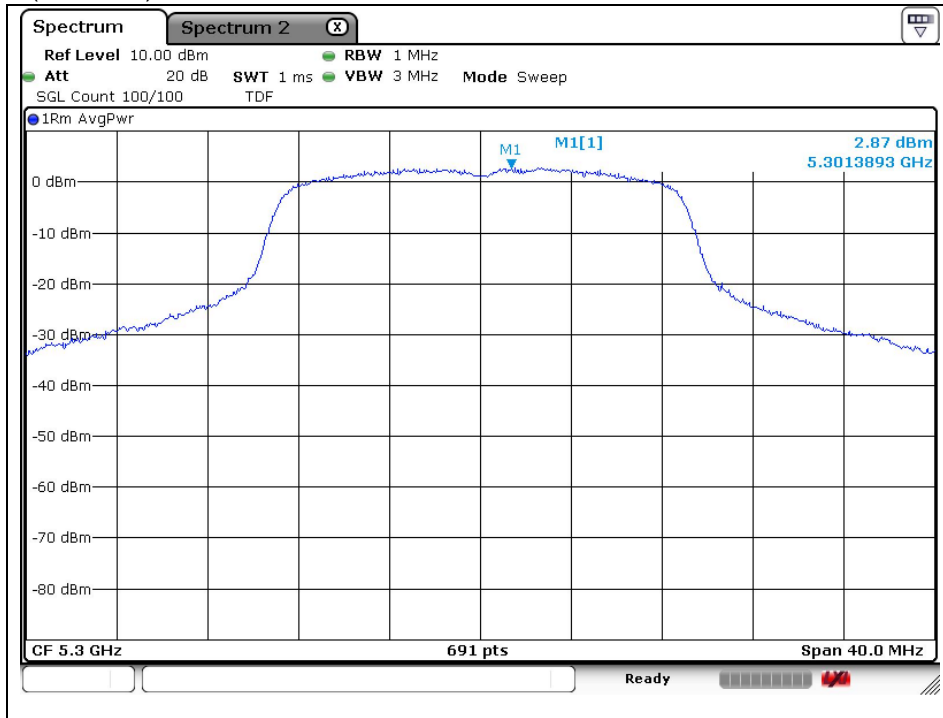
OFDM: 802.11n_HT20 (Band 2A)_ANT 2

Low Channel (5 260 MHz)

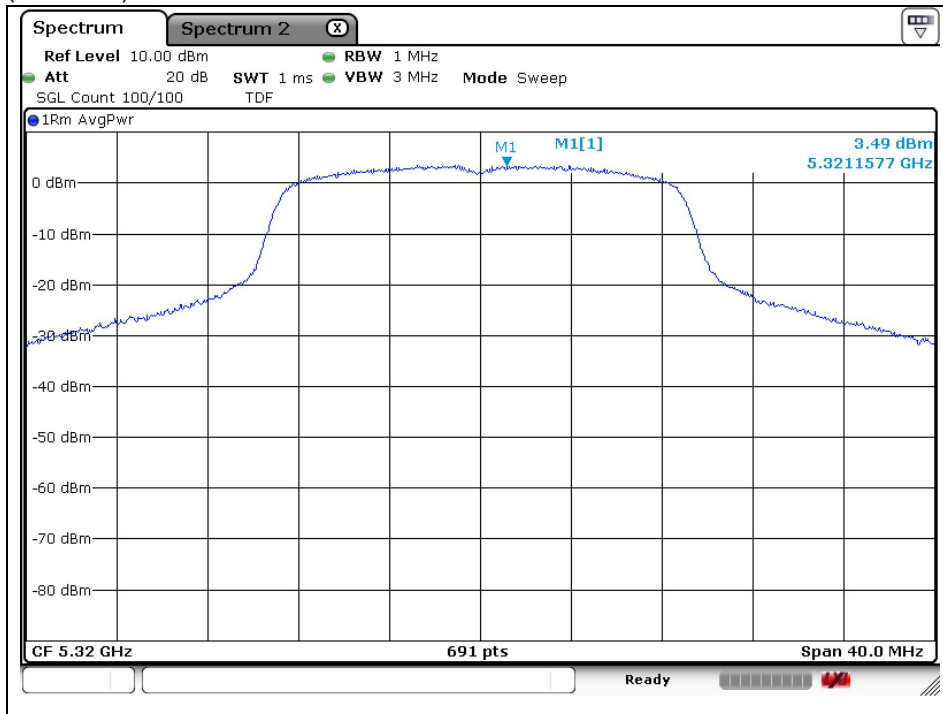


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Middle Channel (5 300 MHz)



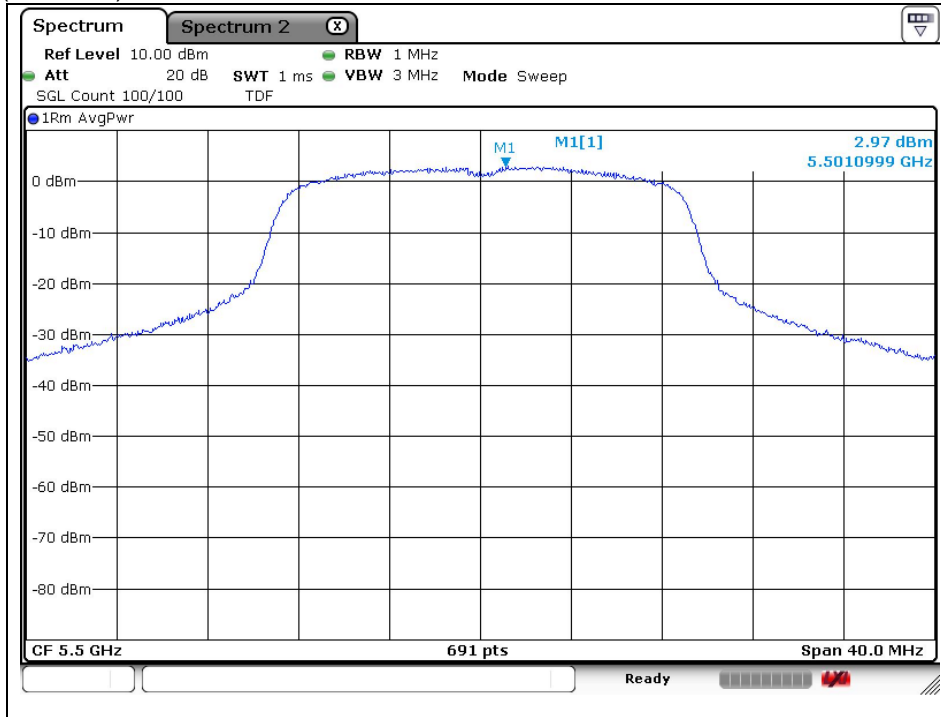
High Channel (5 320 MHz)



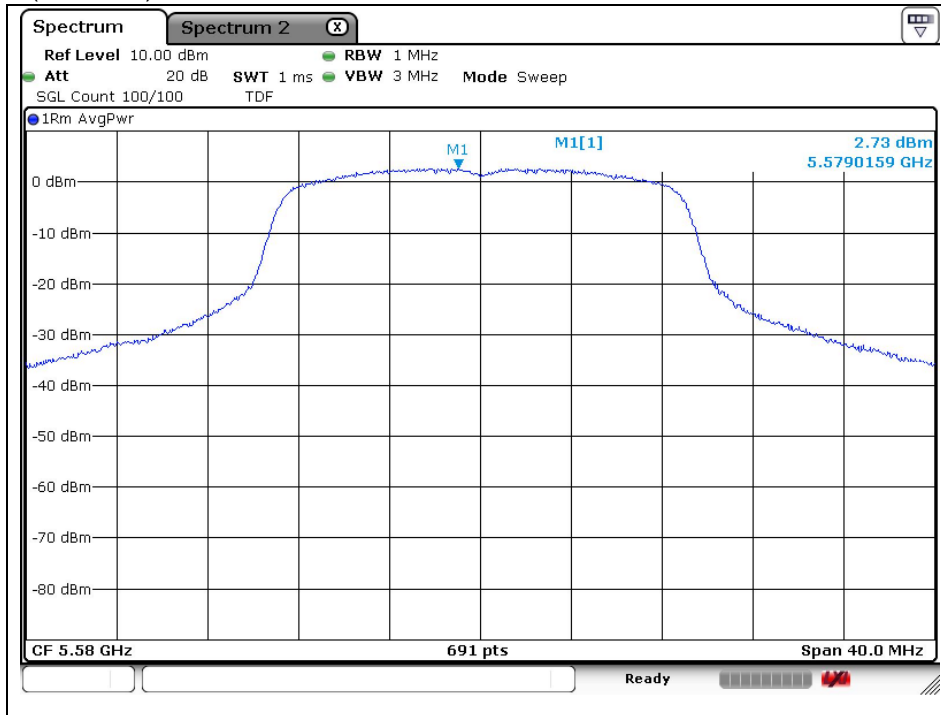
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OFDM: 802.11n_HT20 (Band 2C)_ANT 2

Low Channel (5 500 MHz)

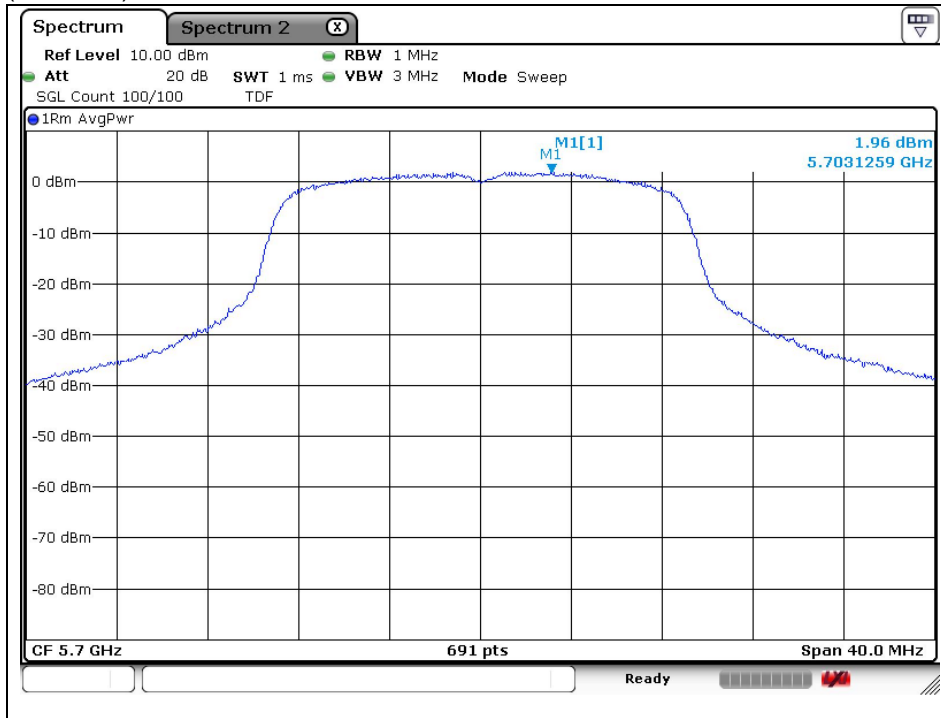


Middle Channel (5 580 MHz)



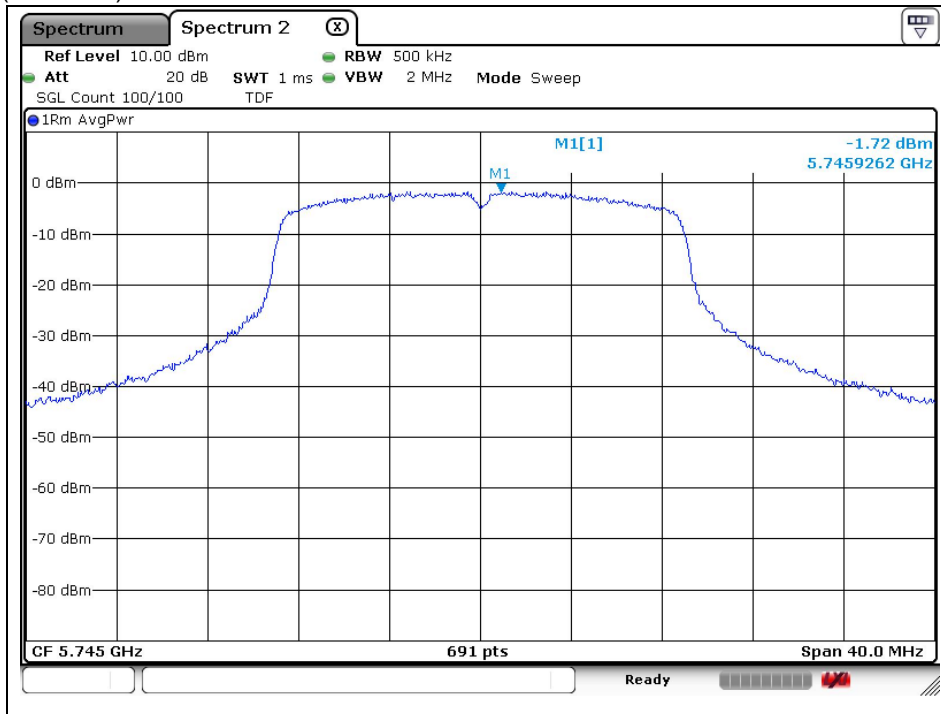
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High Channel (5 700 MHz)



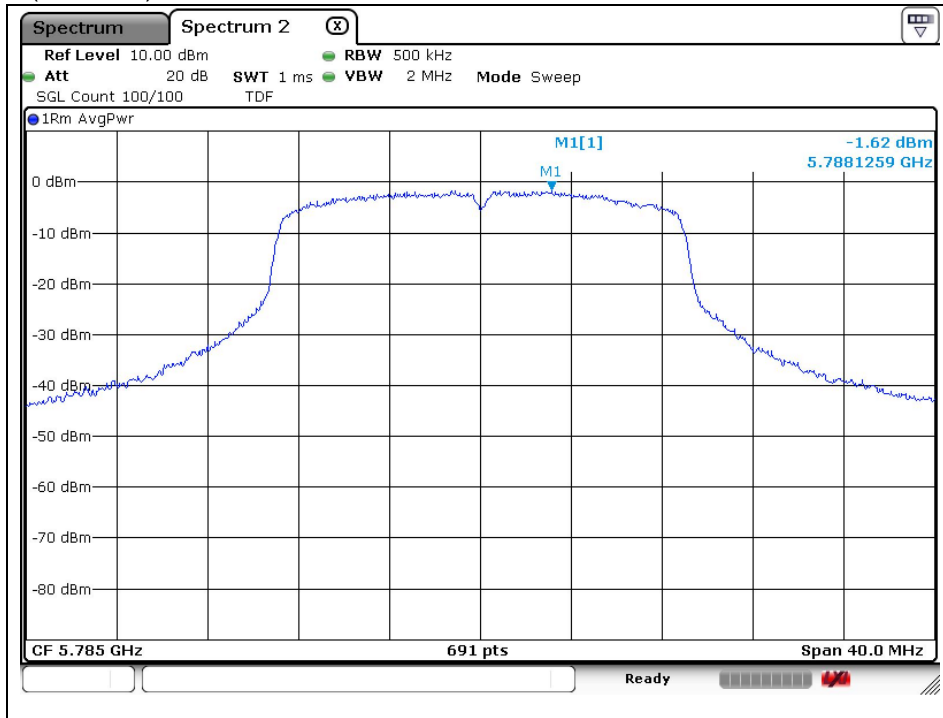
OFDM: 802.11n_HT20 (Band 3)_ANT 2

Low Channel (5 745 MHz)

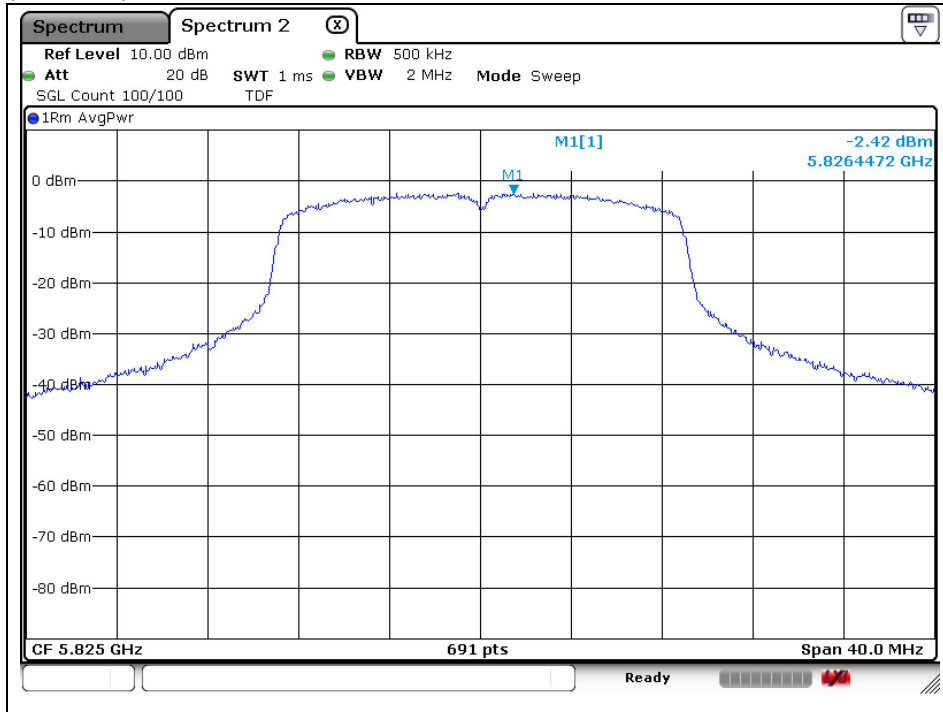


The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

Middle Channel (5 785 MHz)



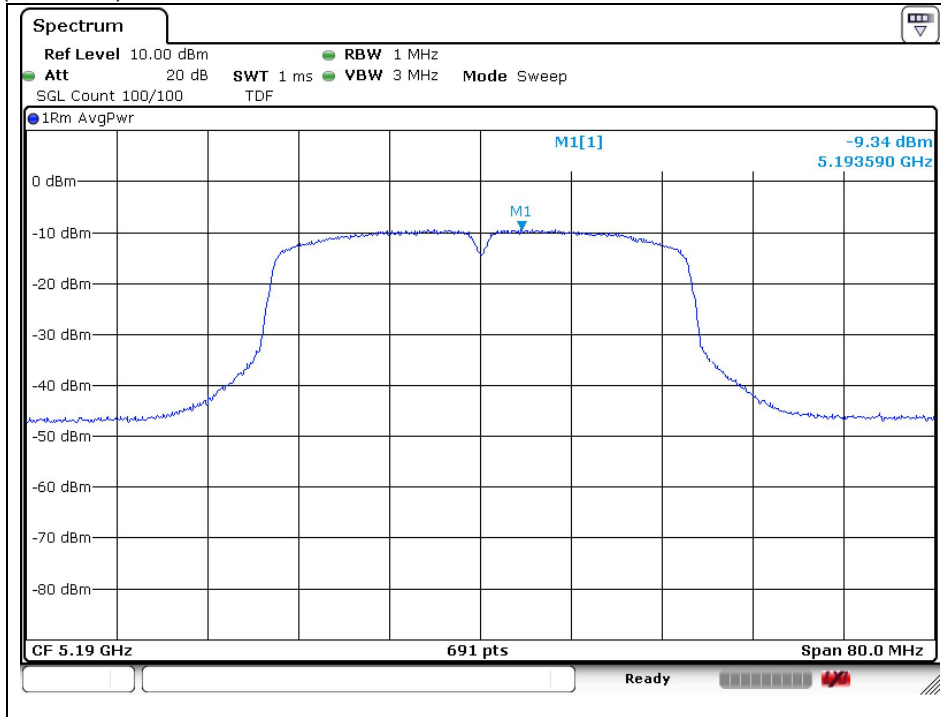
High Channel (5 825 MHz)



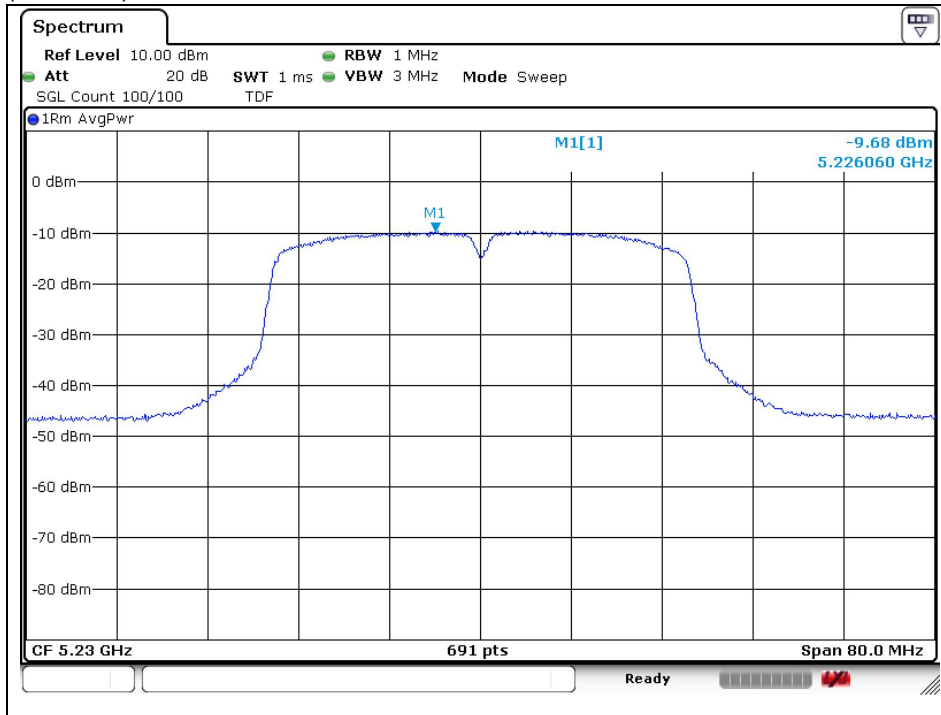
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OFDM: 802.11n_HT40 (Band 1)_ANT 1

Low Channel (5 190 MHz)



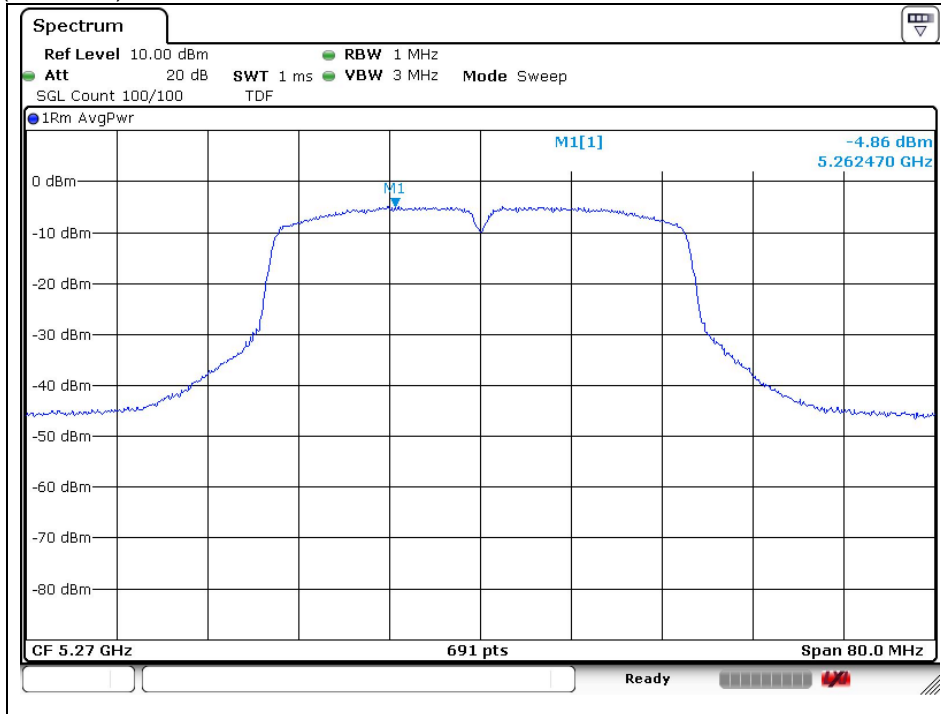
High Channel (5 230 MHz)



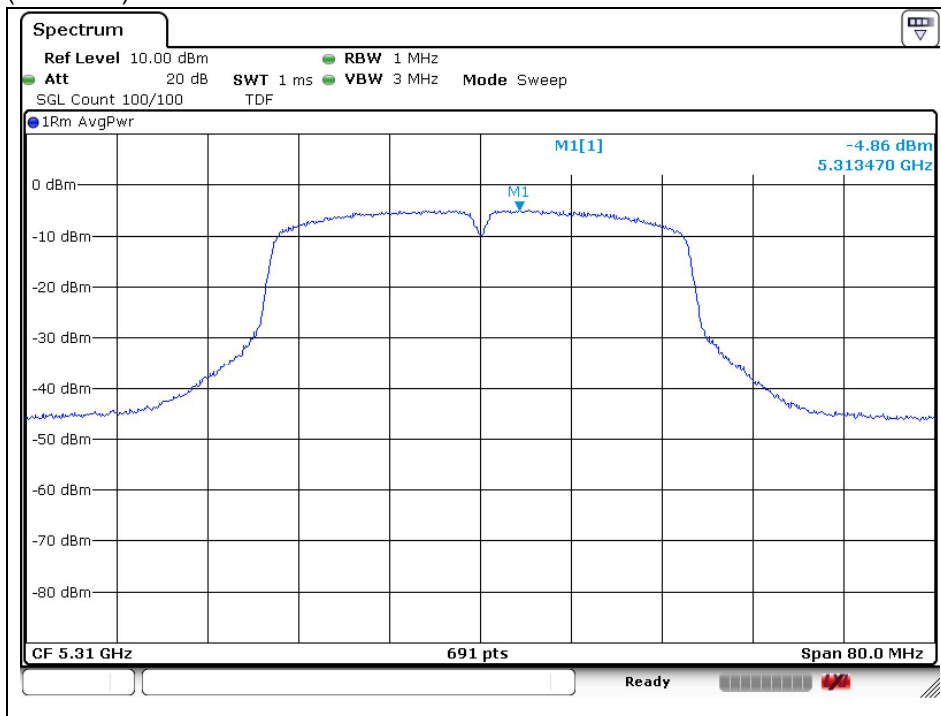
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

OFDM: 802.11n_HT40 (Band 2A)_ANT 1

Low Channel (5 270 MHz)



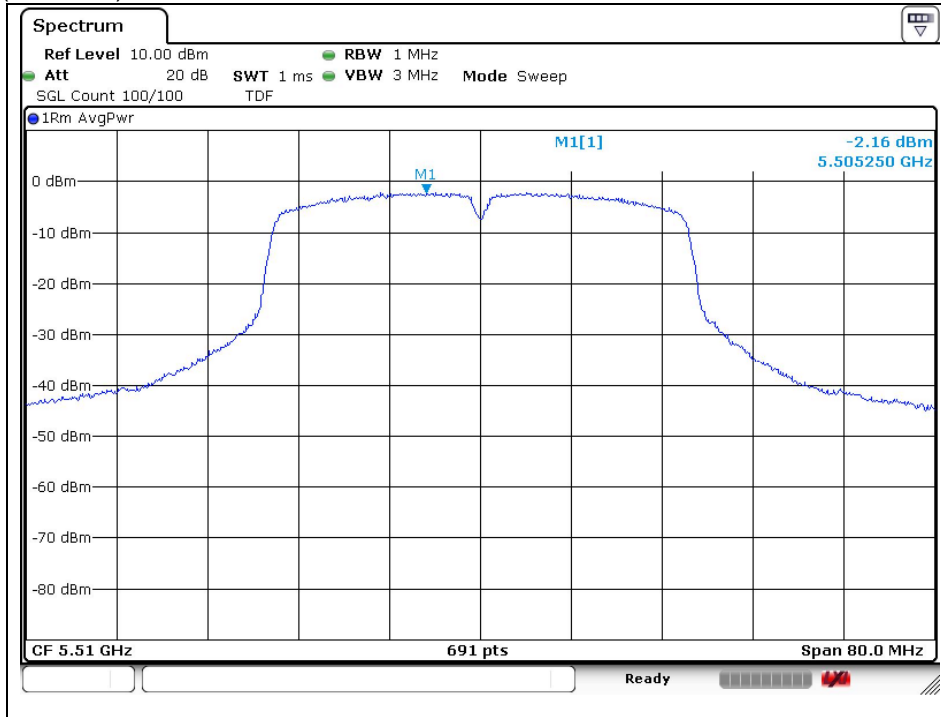
High Channel (5 310 MHz)



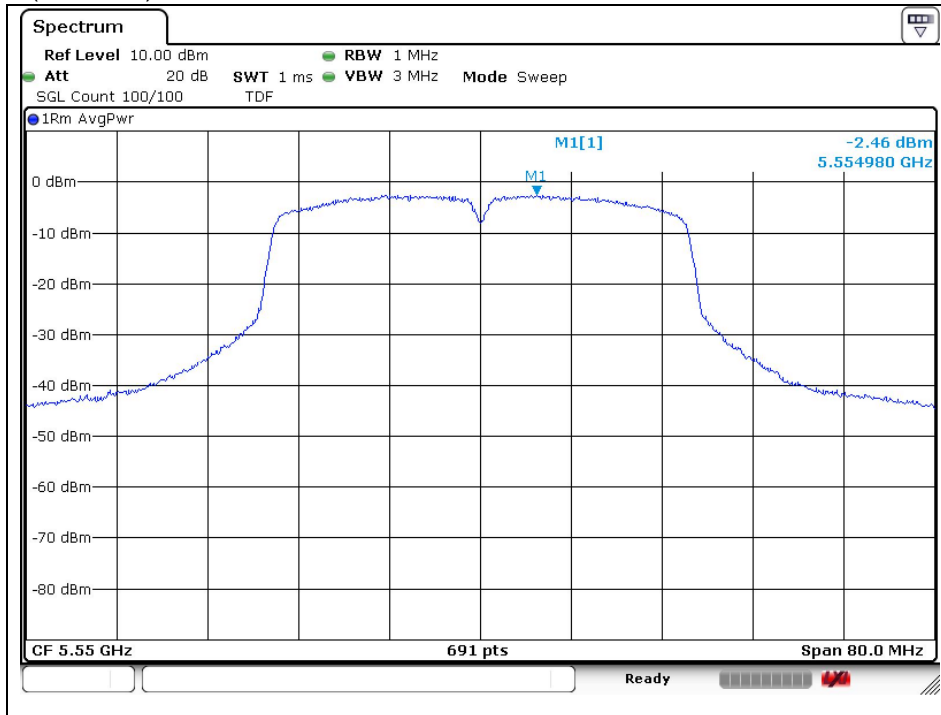
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

OFDM: 802.11n_HT40 (Band 2C)_ANT 1

Low Channel (5 510 MHz)

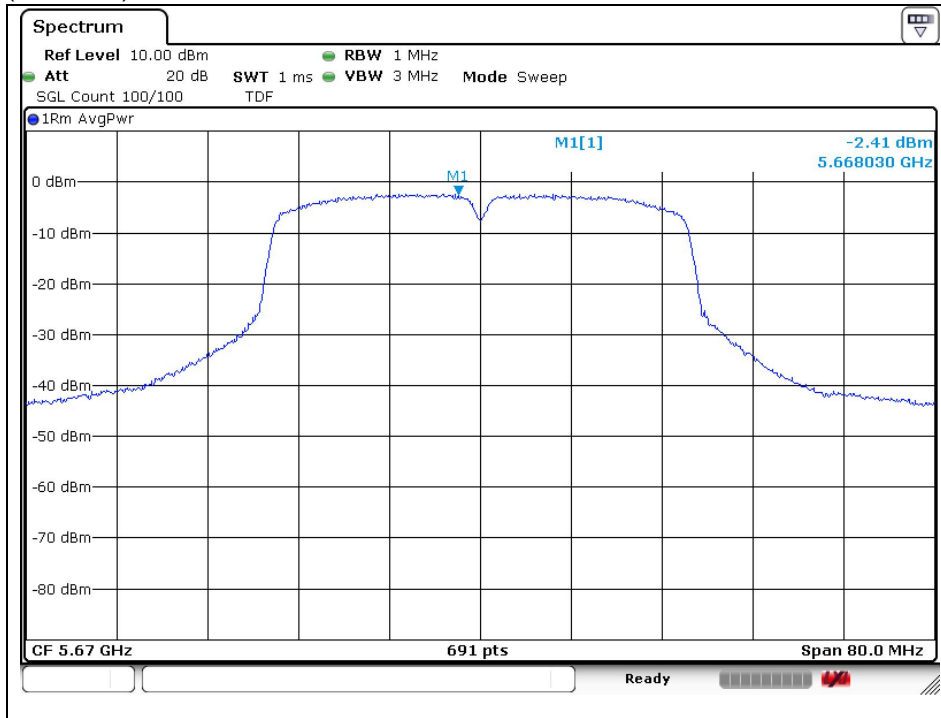


Middle Channel (5 550 MHz)



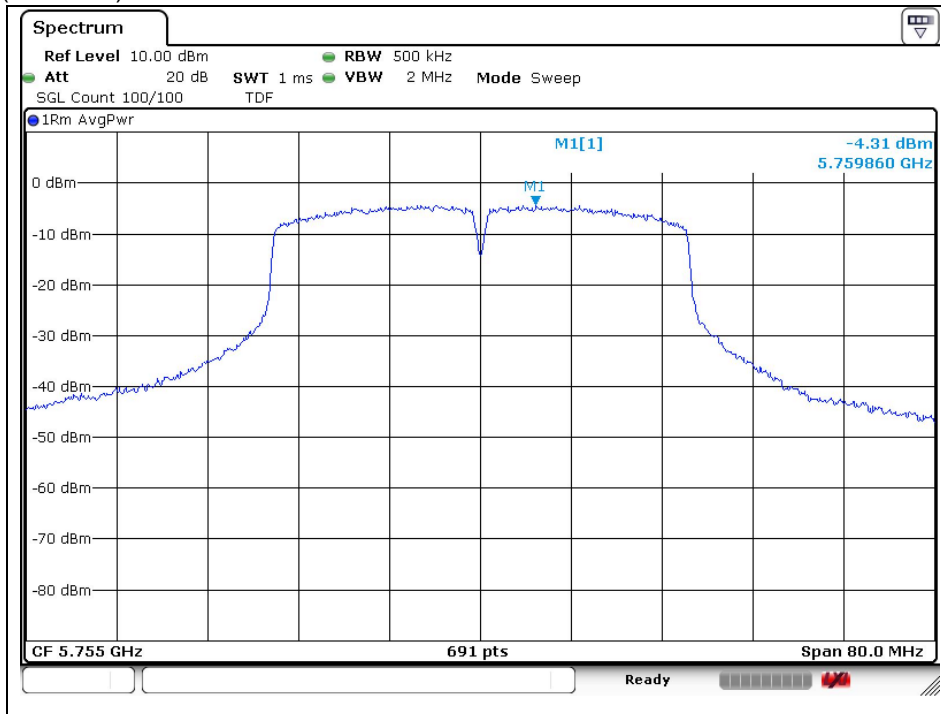
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

High Channel (5 670 MHz)



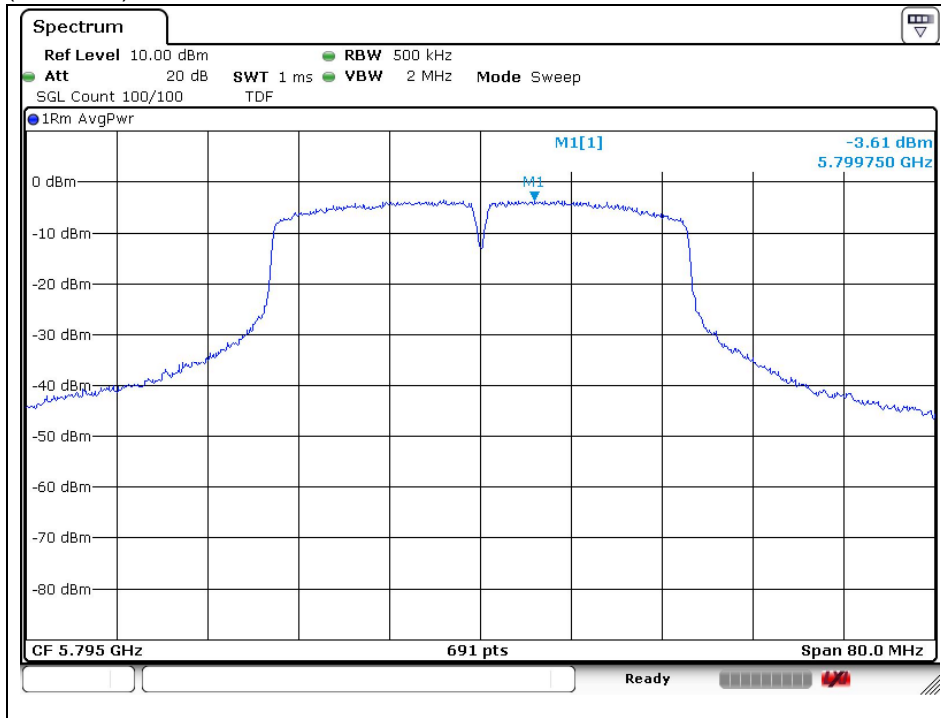
OFDM: 802.11n_HT40 (Band 3)_ANT 1

Low Channel (5 755 MHz)



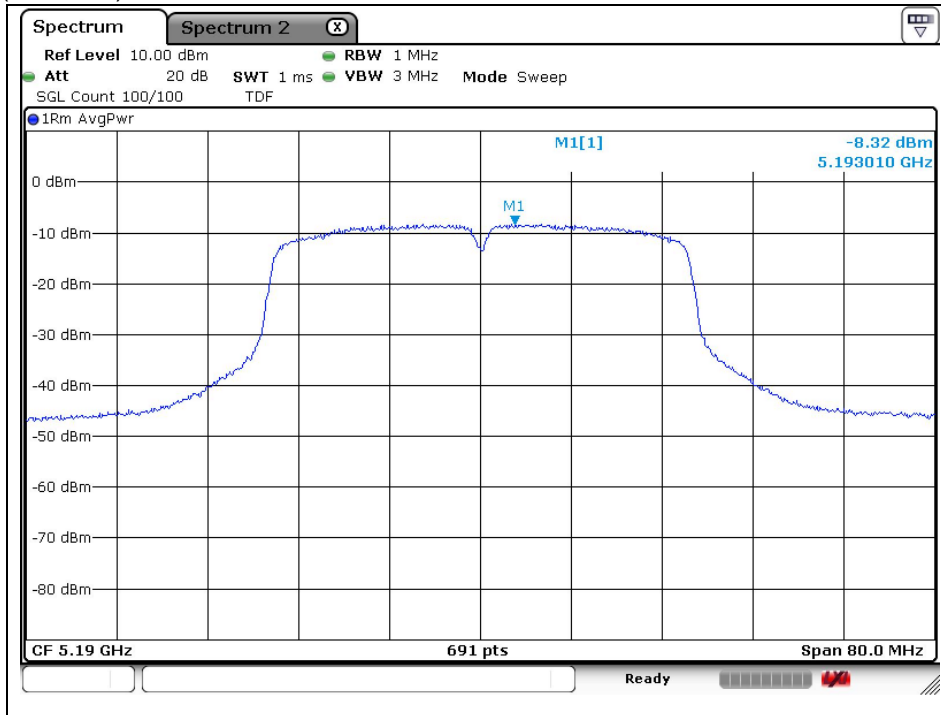
The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

High Channel (5 795 MHz)



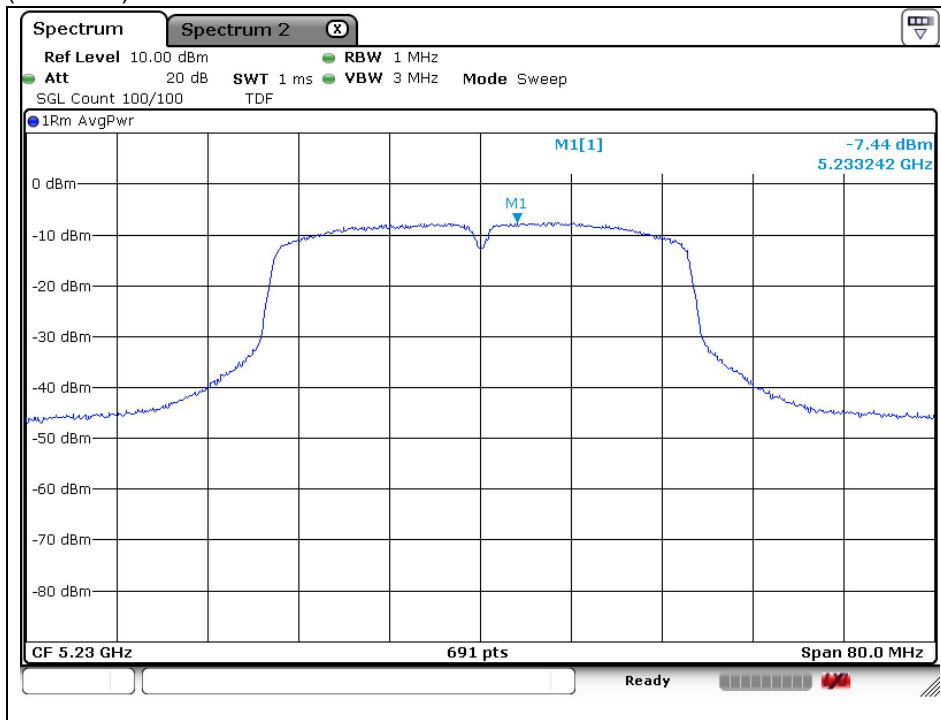
OFDM: 802.11n_HT40 (Band 1)_ANT 2

Low Channel (5 190 MHz)



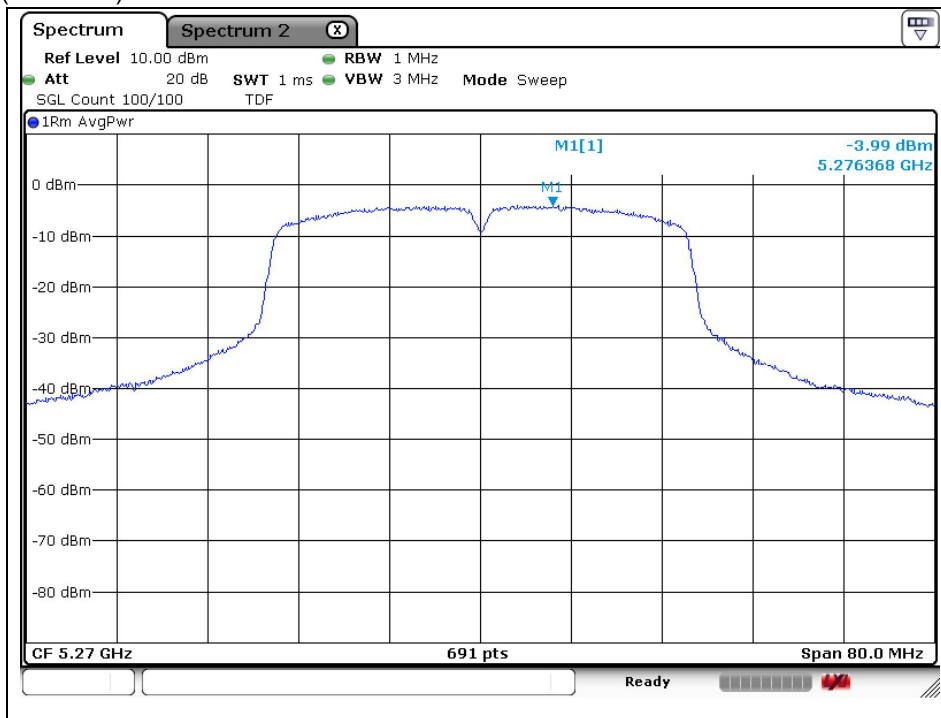
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High Channel (5 230 MHz)



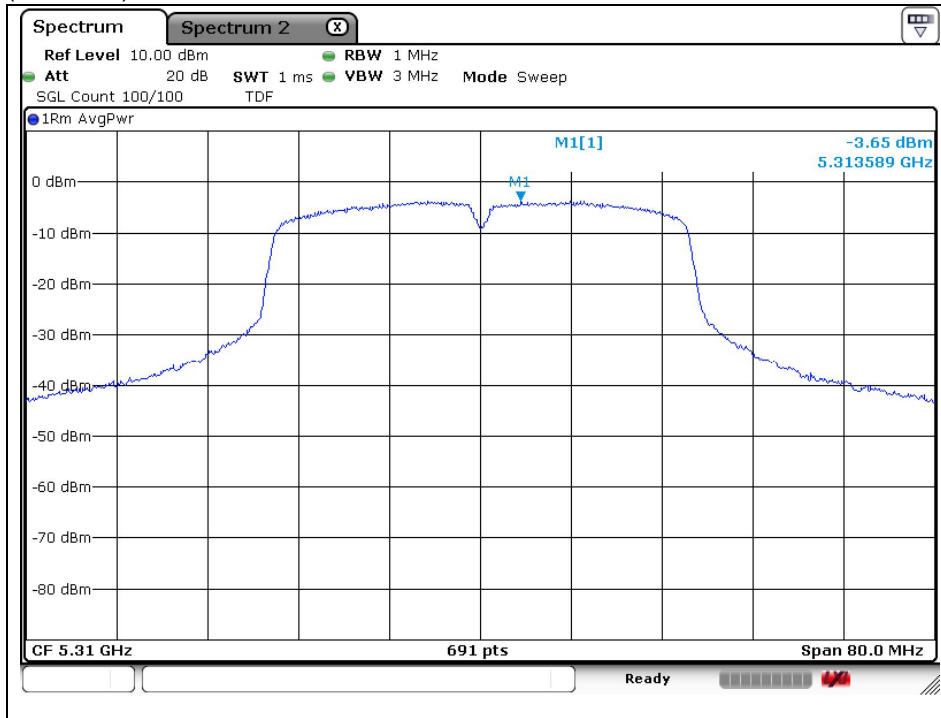
OFDM: 802.11n_HT40 (Band 2A)_ANT 2

Low Channel (5 270 MHz)



The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

High Channel (5 310 MHz)



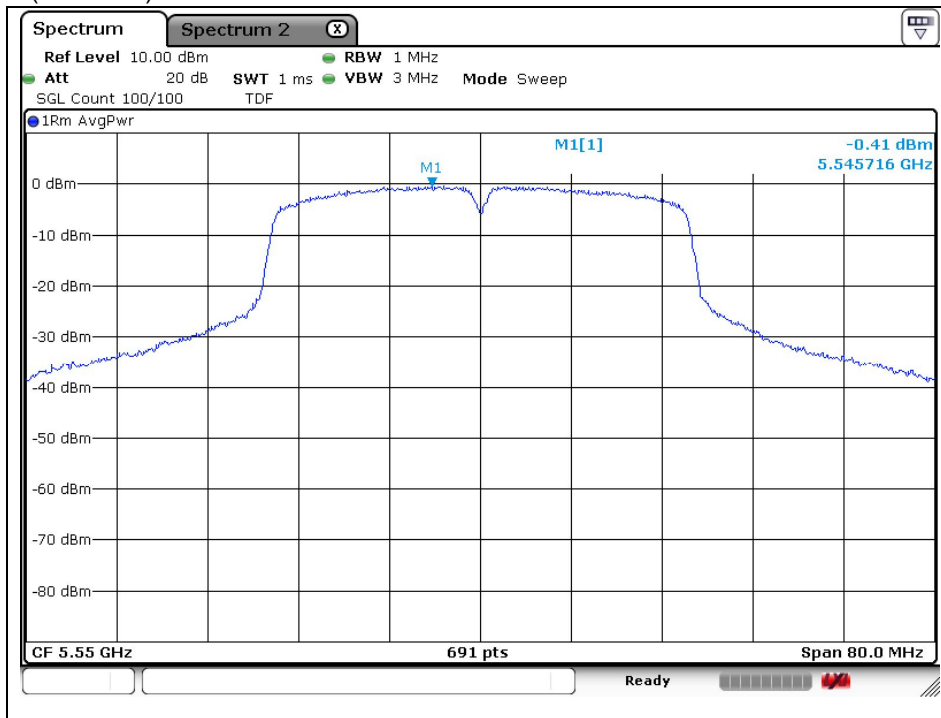
OFDM: 802.11n_HT40 (Band 2C)_ANT 2

Low Channel (5 510 MHz)

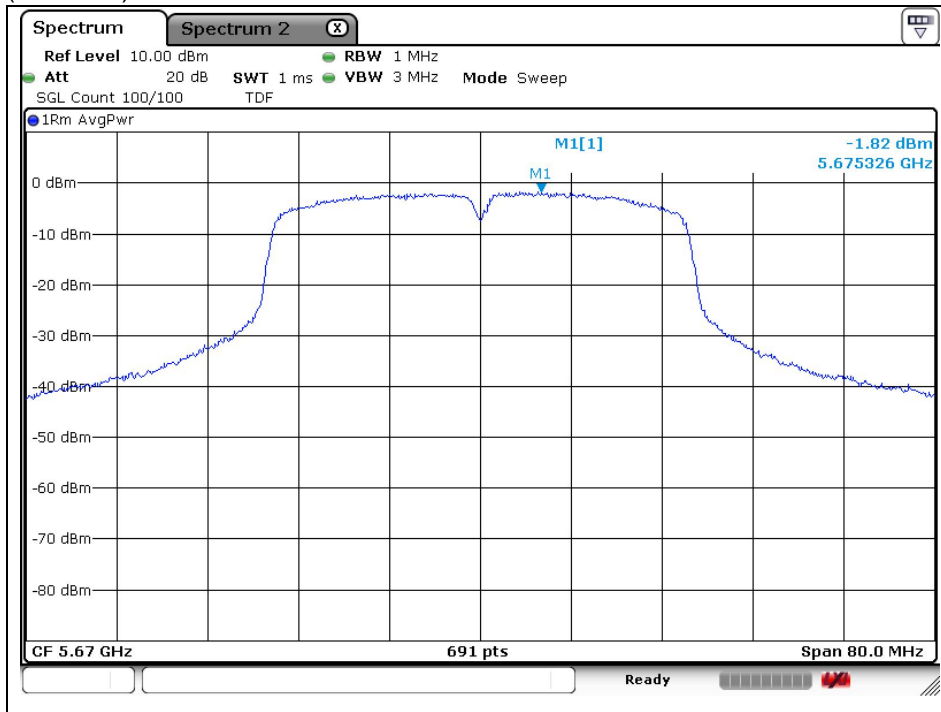


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Middle Channel (5 550 MHz)



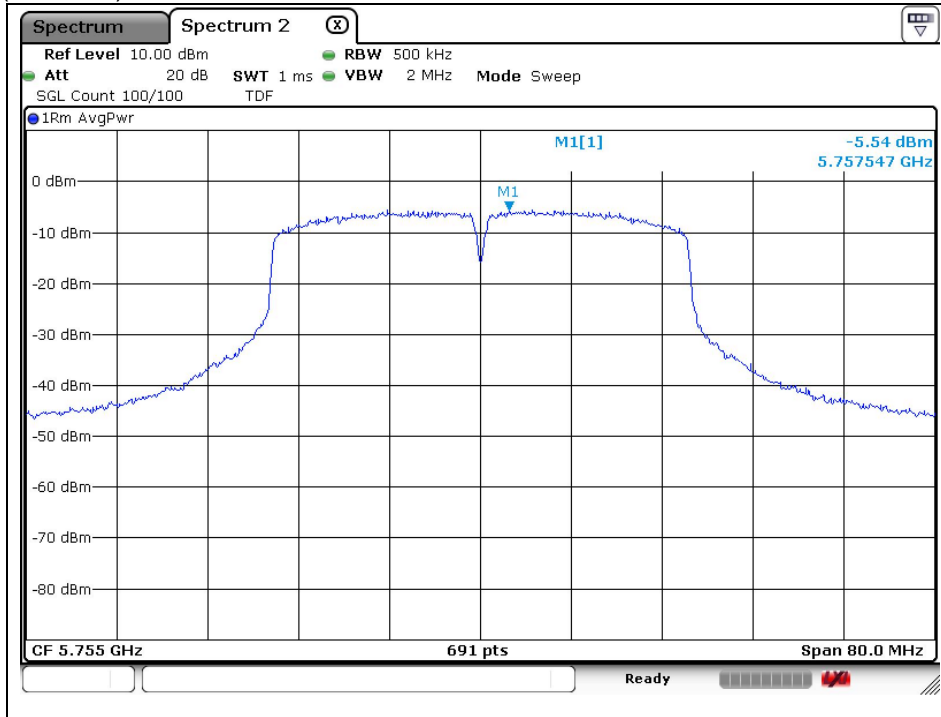
High Channel (5 670 MHz)



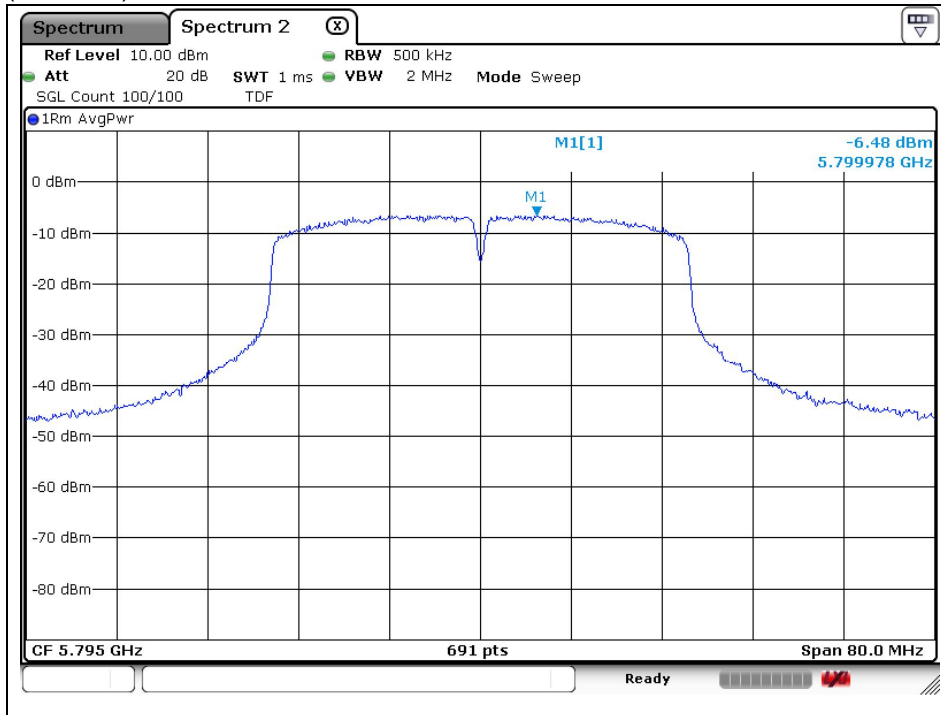
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OFDM: 802.11n_HT40 (Band 3)_ANT 2

Low Channel (5 755 MHz)



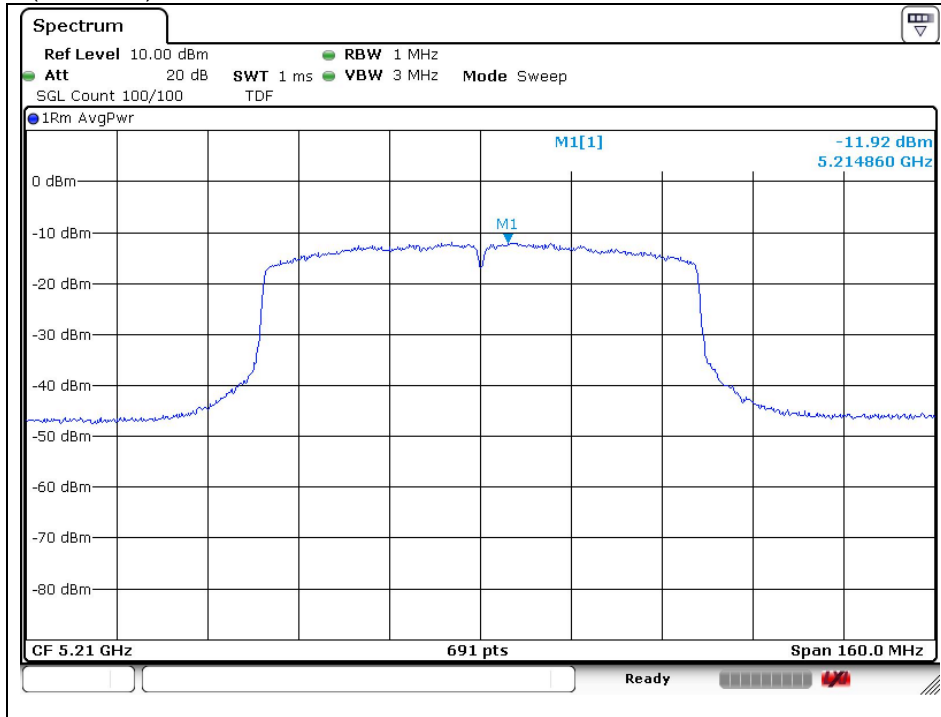
High Channel (5 795 MHz)



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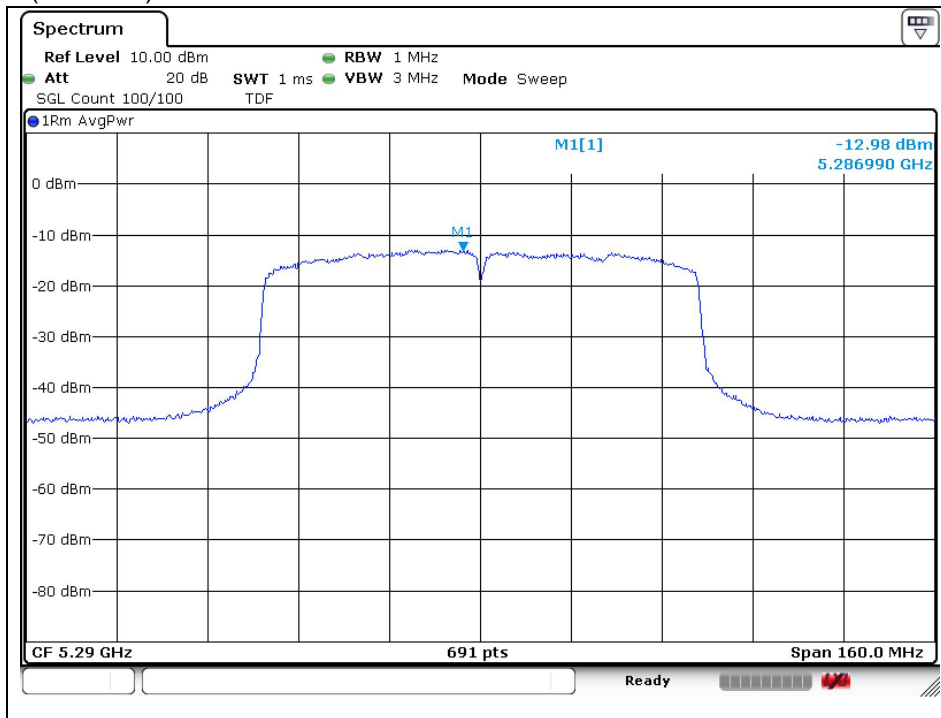
OFDM: 802.11ac_VHT80 (Band 1)_ANT 1

Middle Channel (5 210 MHz)



OFDM: 802.11ac_VHT80 (Band 2A)_ANT 1

Middle Channel (5 290 MHz)

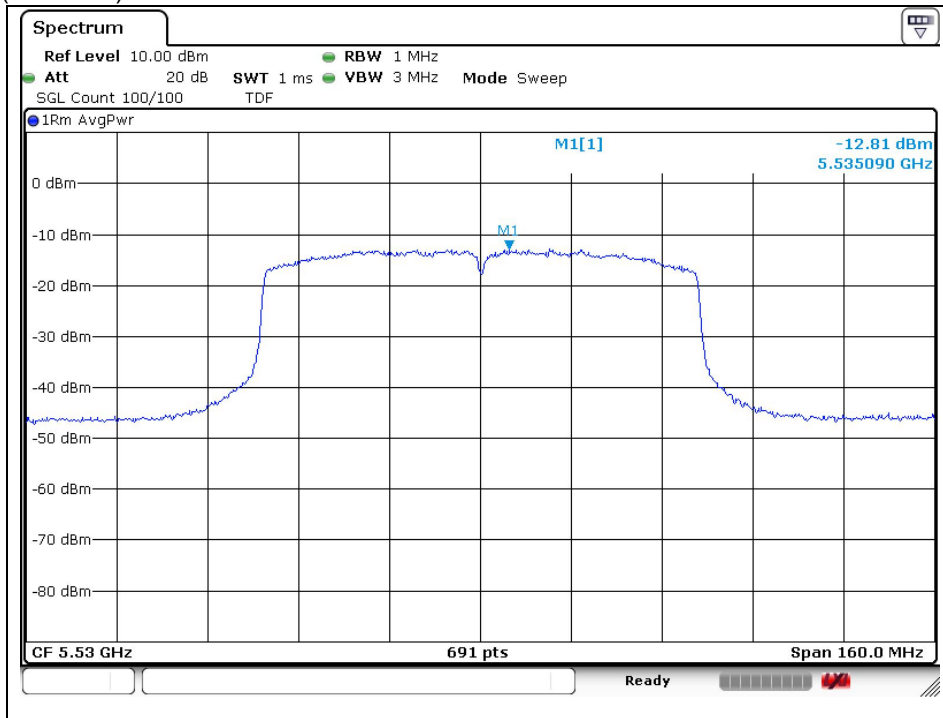


The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

SGS Korea Co., Ltd. (Gunpo Laboratory) 4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, Korea, 15807 <http://www.sgsgroup.kr>

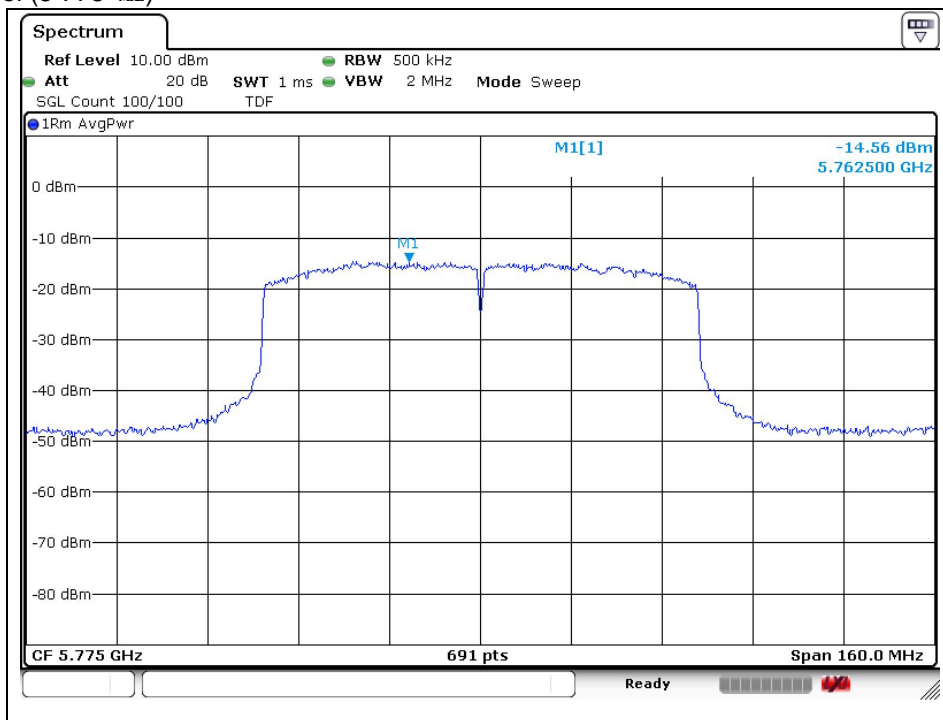
OFDM: 802.11ac_VHT80 (Band 2C)_ANT 1

Low Channel (5 530 MHz)



OFDM: 802.11ac_VHT80 (Band 3)_ANT 1

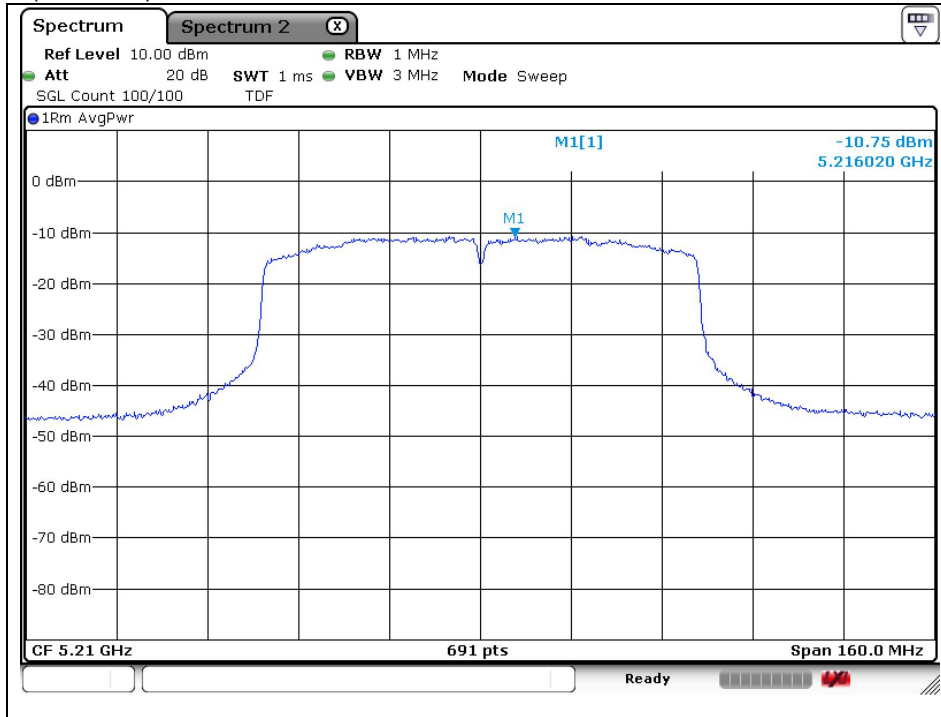
Middle Channel (5 775 MHz)



The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

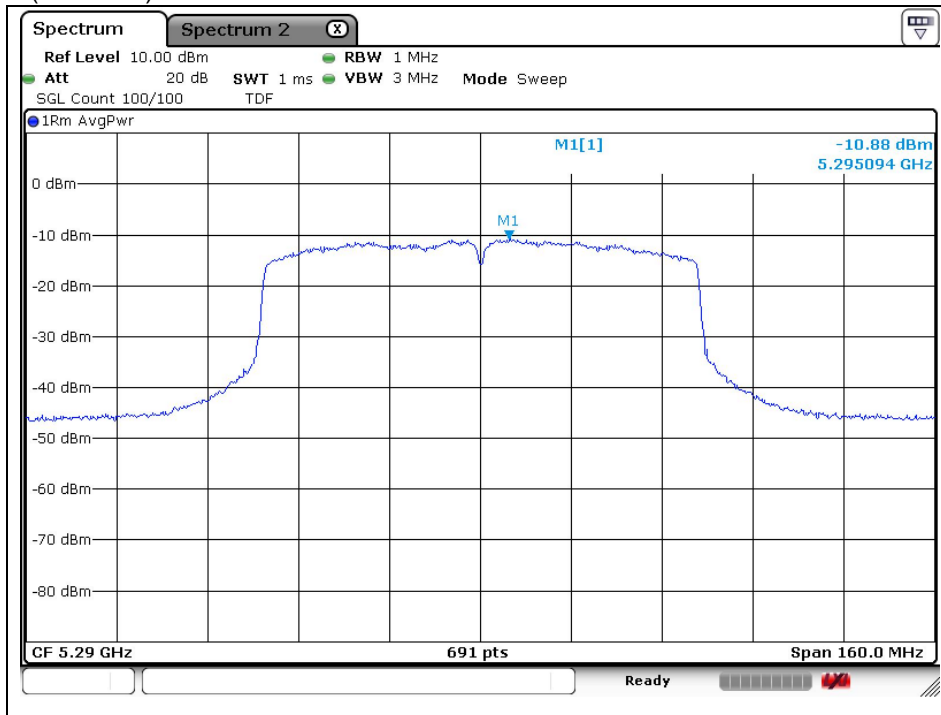
OFDM: 802.11ac_VHT80 (Band 1)_ANT 2

Middle Channel (5 210 MHz)



OFDM: 802.11ac_VHT80 (Band 2A)_ANT 2

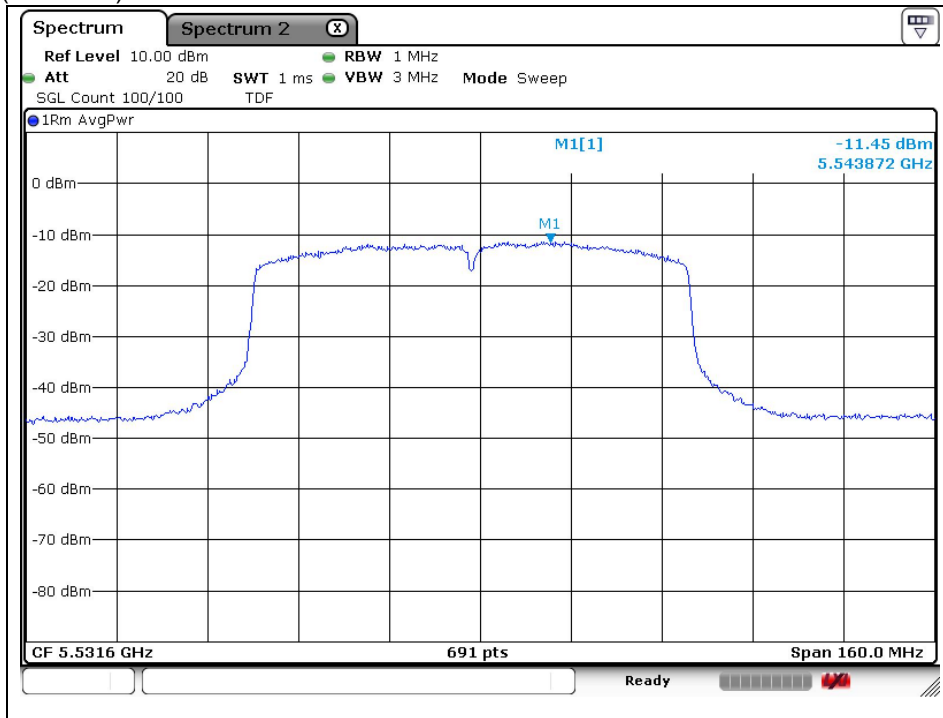
Middle Channel (5 290 MHz)



The results of this test report are effective only to the items tested. The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received. This test report cannot be reproduced, except in full, without prior written permission of the Company. This test report does not assure KOLAS accreditation.

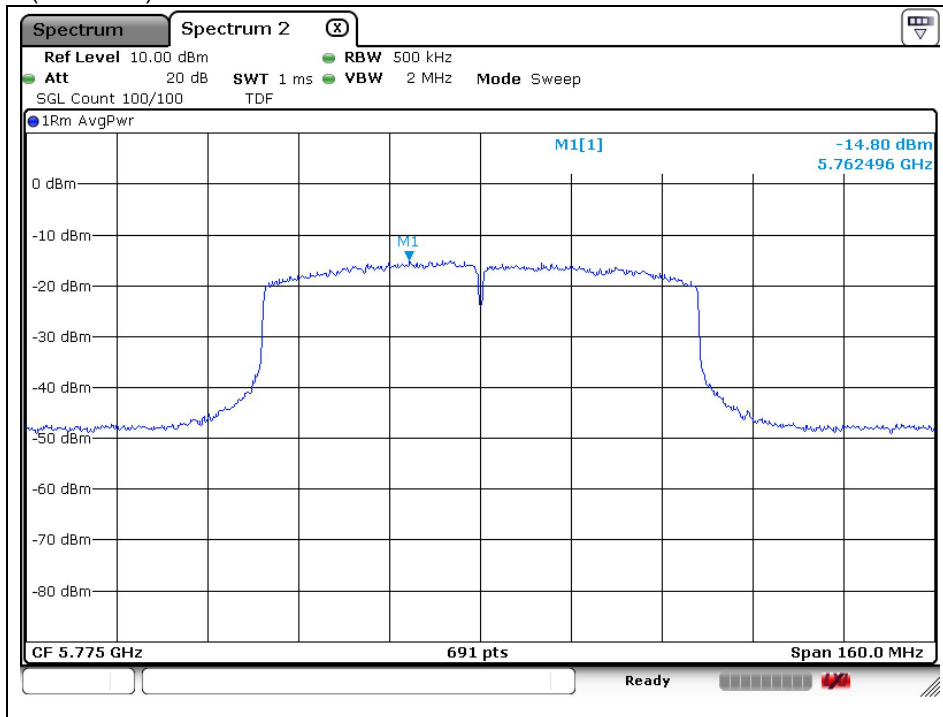
OFDM: 802.11ac_VHT80 (Band 2C)_ANT 2

Low Channel (5 530 MHz)



OFDM: 802.11ac_VHT80 (Band 3)_ANT 2

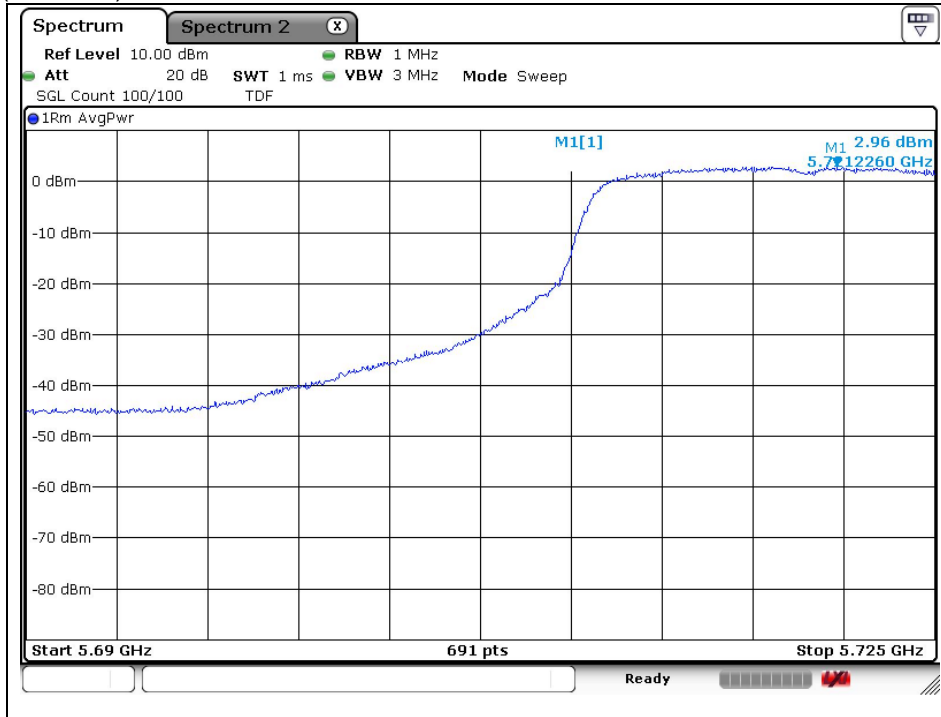
Middle Channel (5 775 MHz)



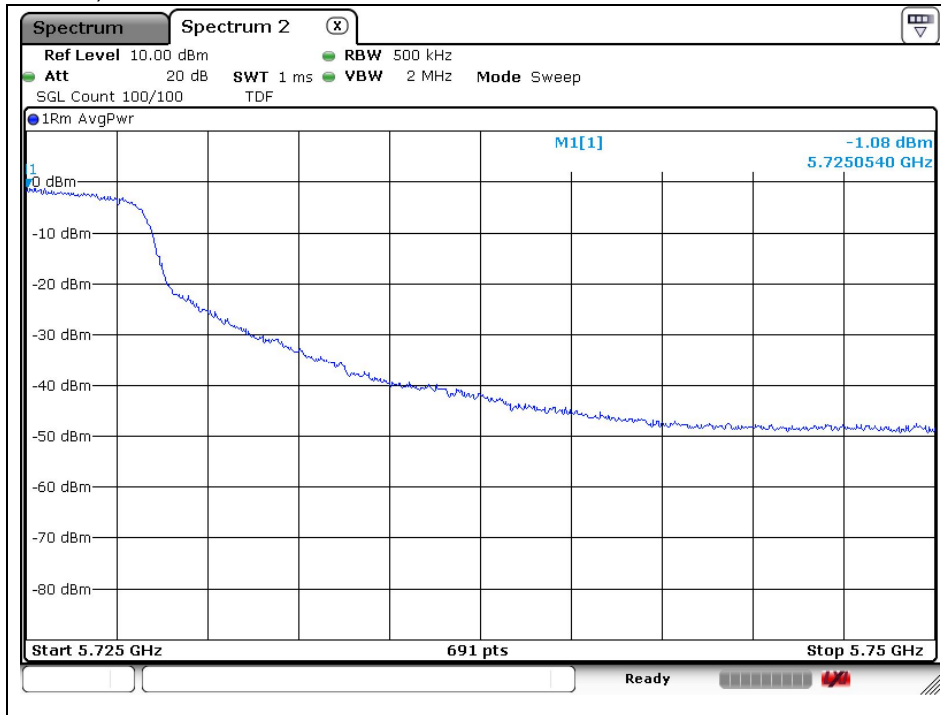
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Band-crossing channels

U-NII 2C 11a (5 720 MHz)_ANT1

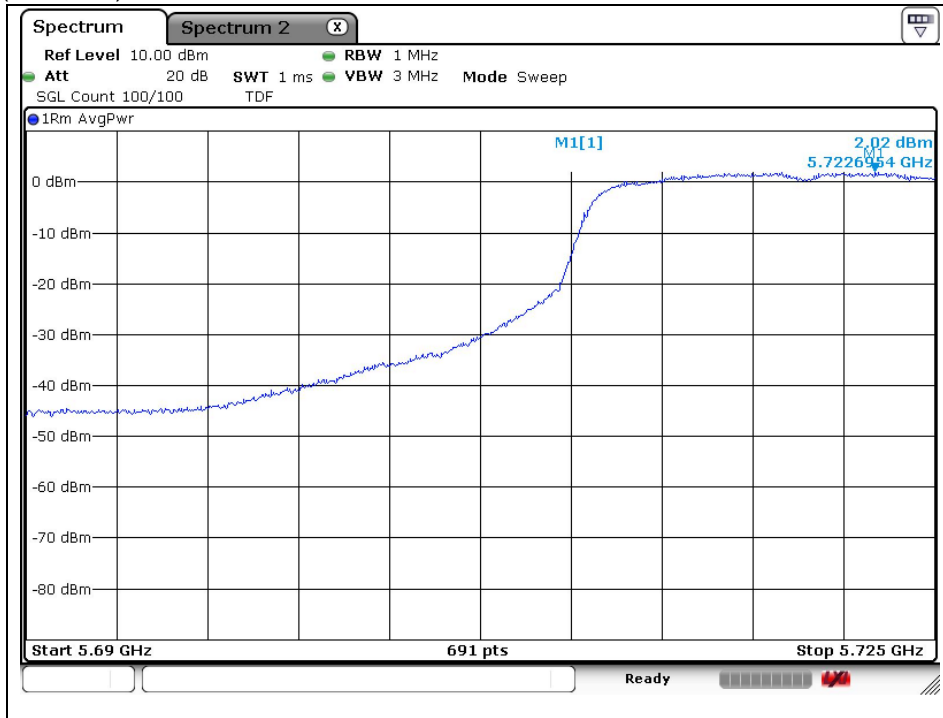


U-NII 3 11a (5 720 MHz)_ANT1

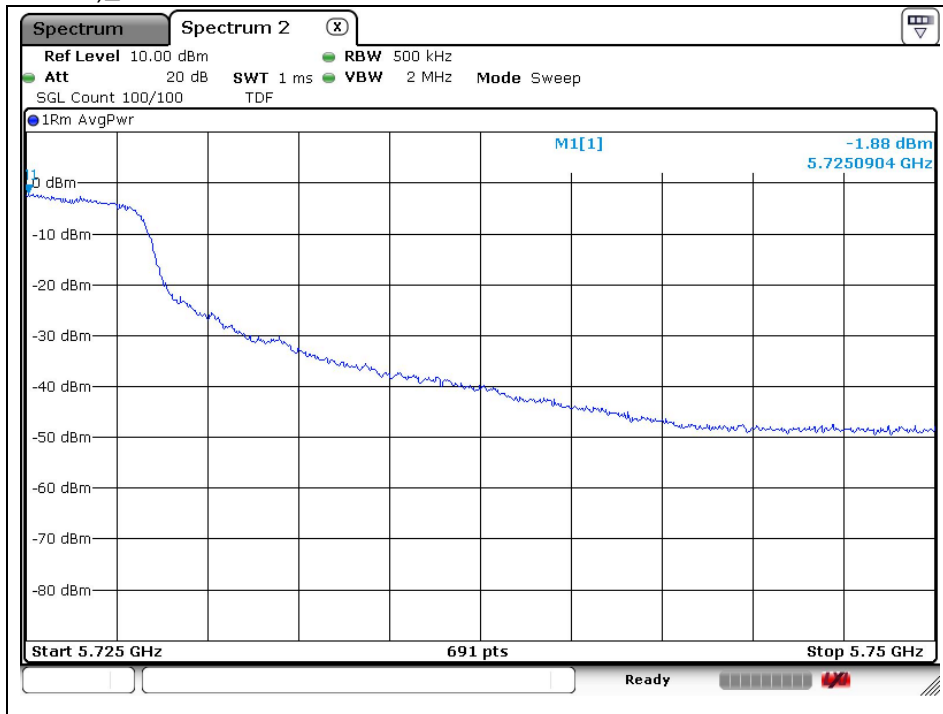


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U-NII 2C 11a (5 720 MHz)_ANT2

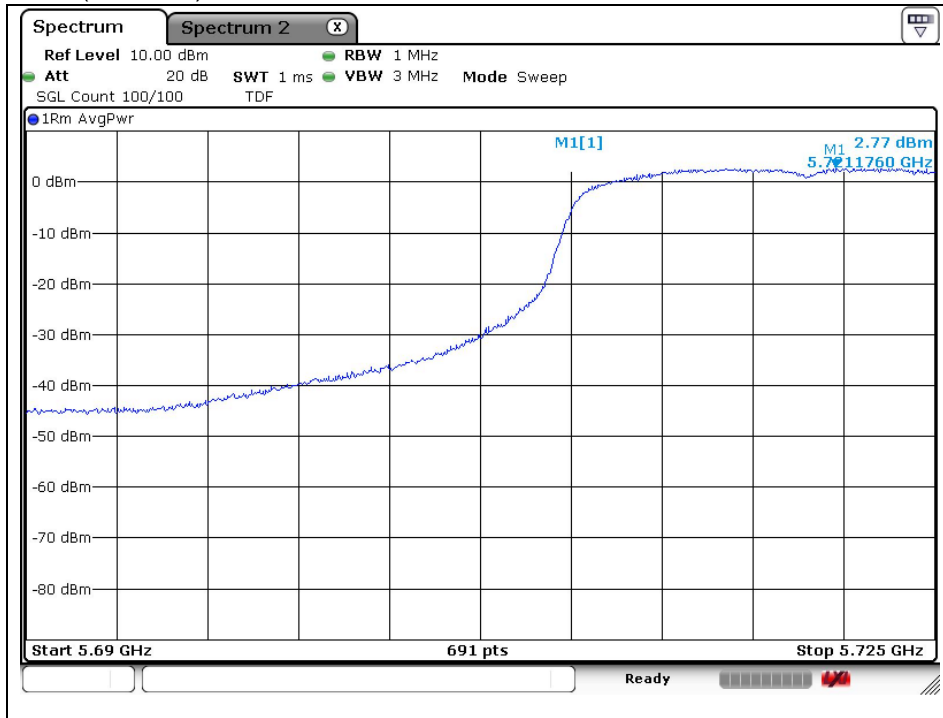


U-NII 3 11a (5 720 MHz)_ANT2

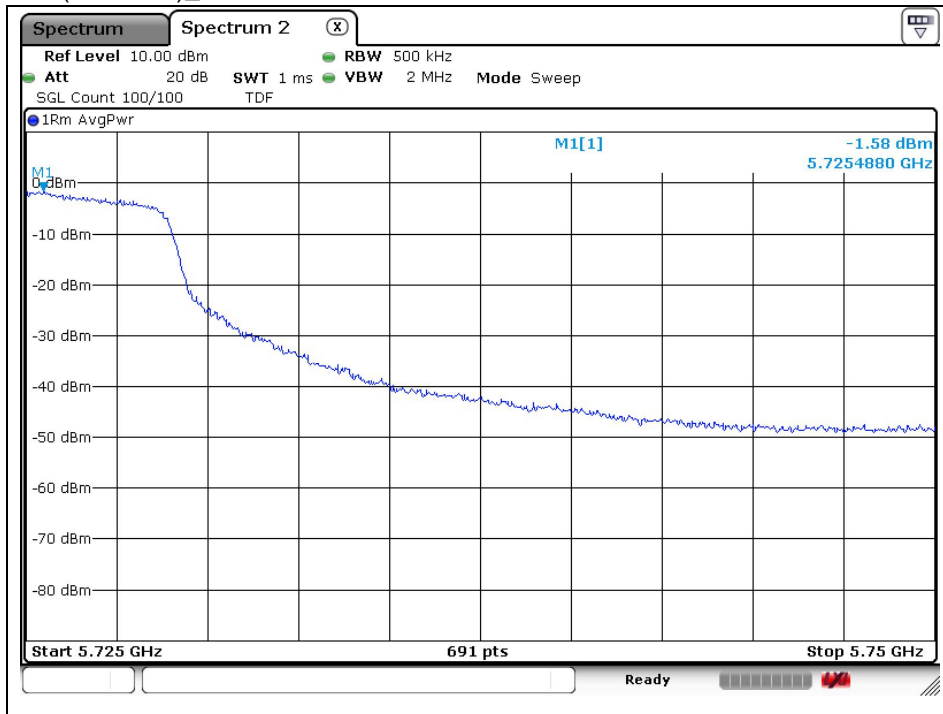


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U-NII 2C 11n_HT20 (5 720 MHz)_ANT1

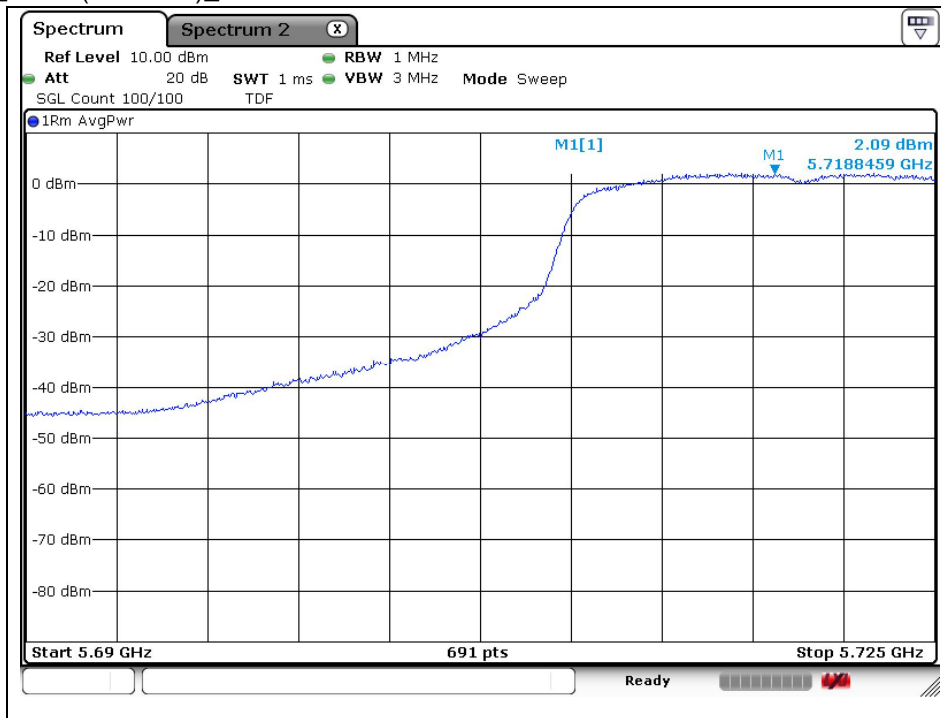


U-NII 3 11n_HT20 (5 720 MHz)_ANT1

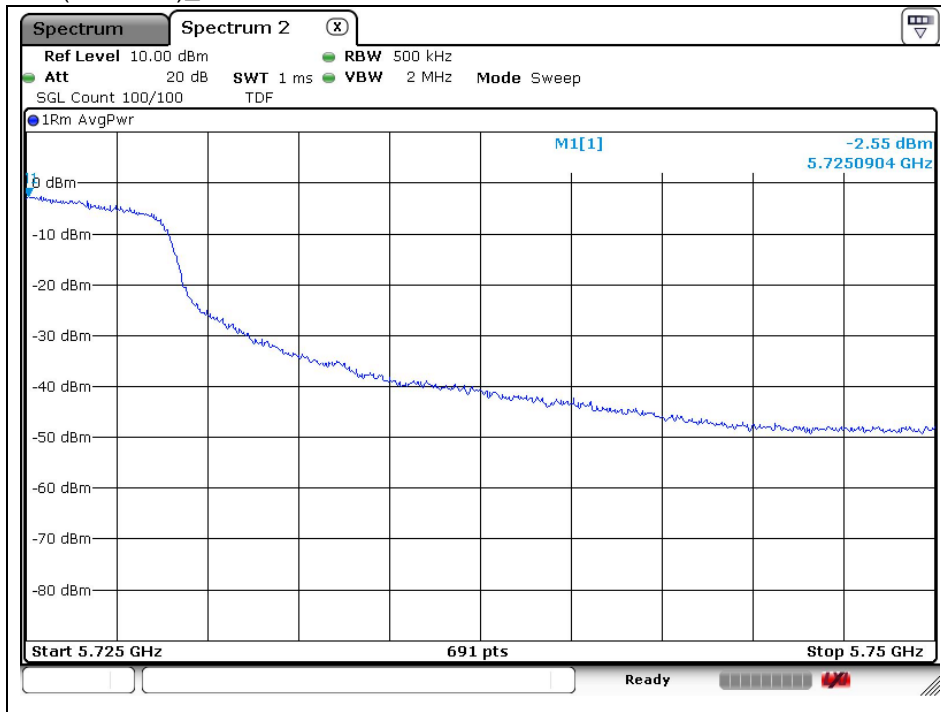


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U-NII 2C 11n_HT20 (5 720 MHz)_ANT2

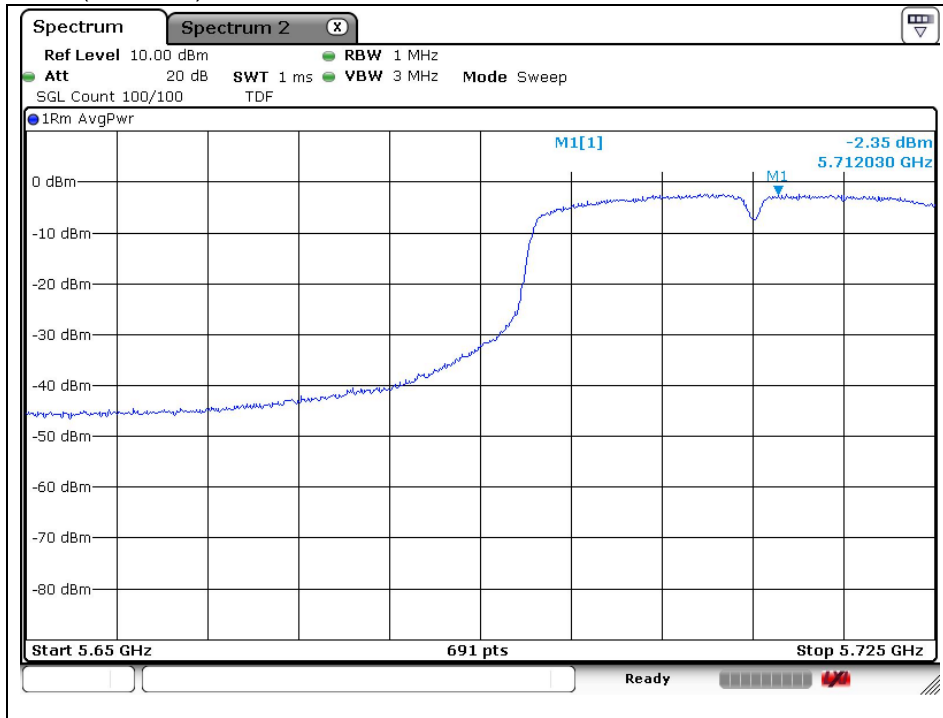


U-NII 3 11n_HT20 (5 720 MHz)_ANT2

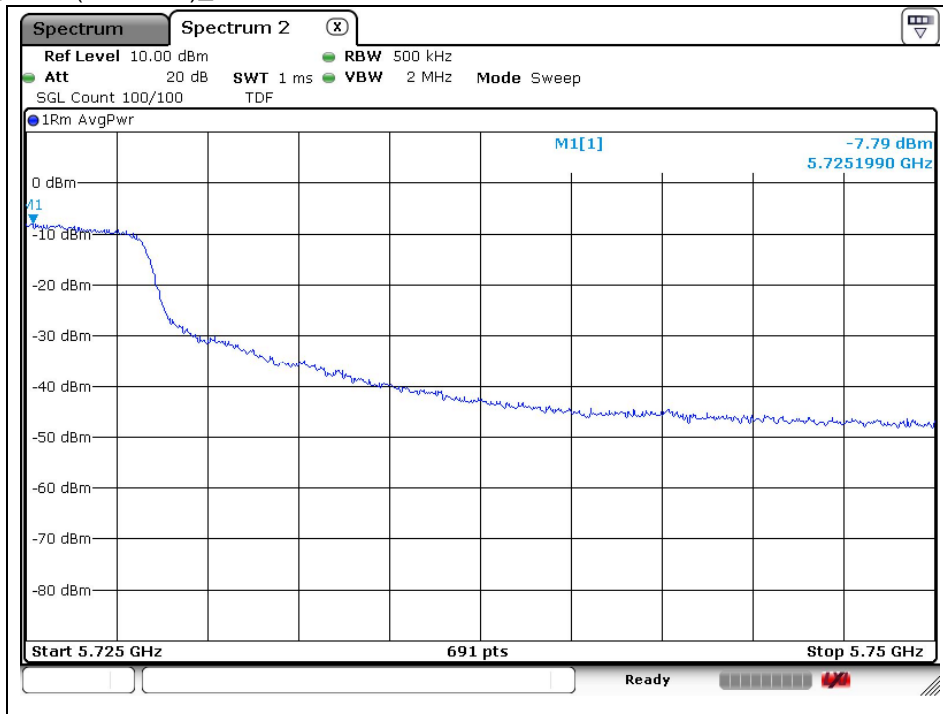


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U-NII 2C 11n_HT40 (5 710 MHz)_ANT1

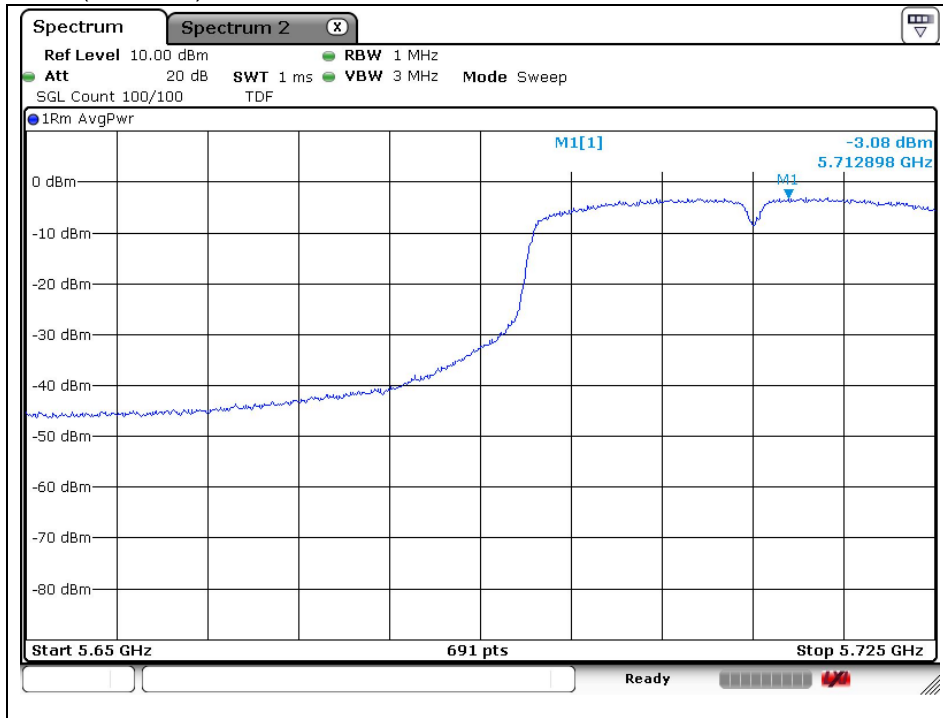


U-NII 3 11n_HT40 (5 710 MHz)_ANT1

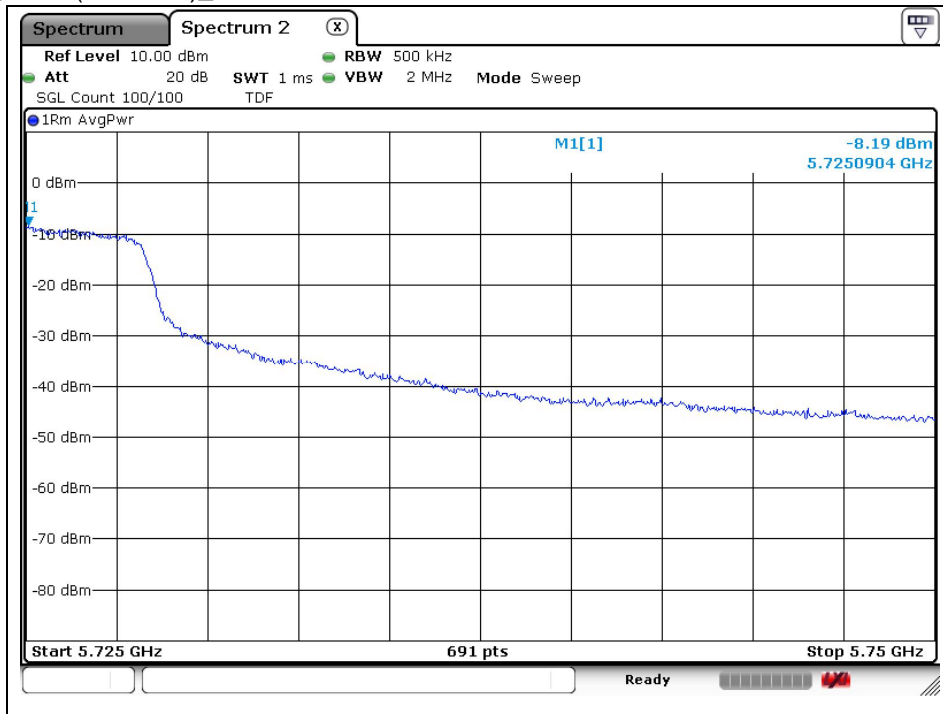


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U-NII 2C 11n_HT40 (5 710 MHz)_ANT2

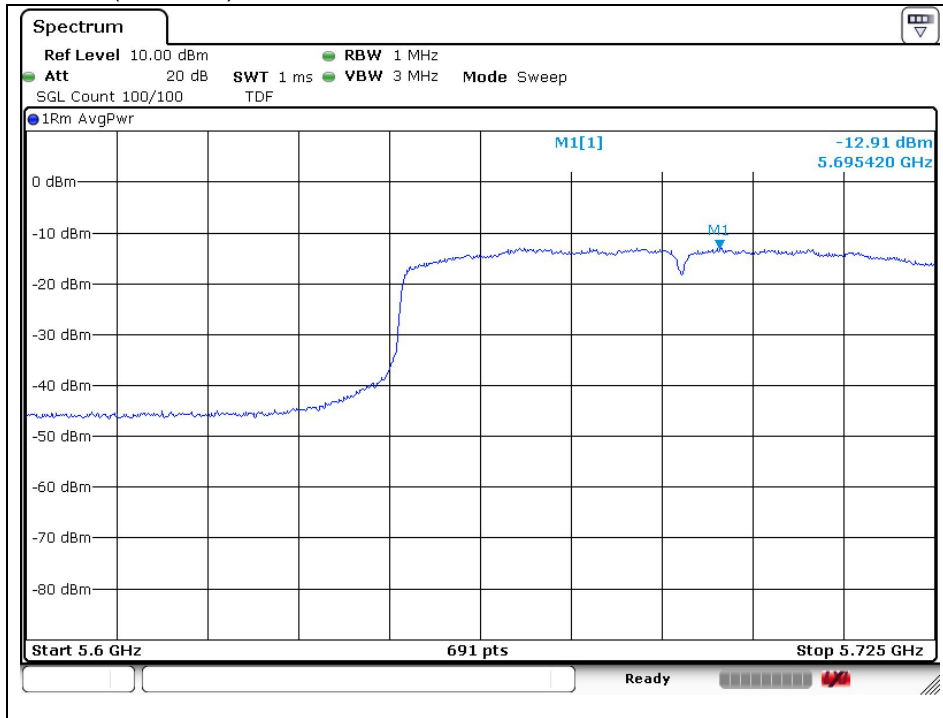


U-NII 3 11n_HT40 (5 710 MHz)_ANT2

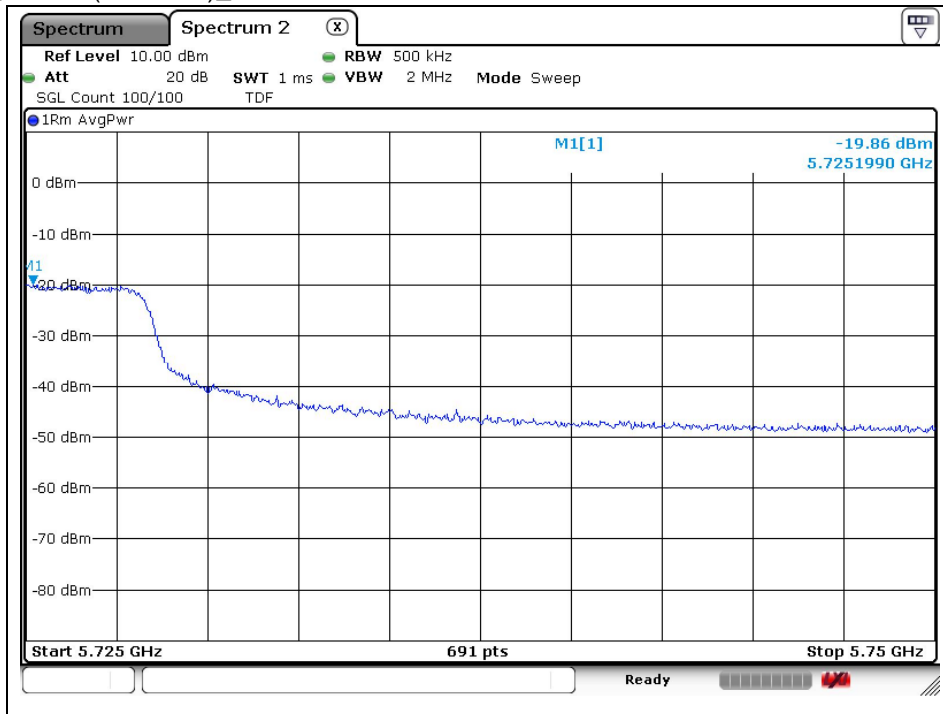


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U-NII 2C 11ac_VHT80 (5 690 MHz)_ANT1

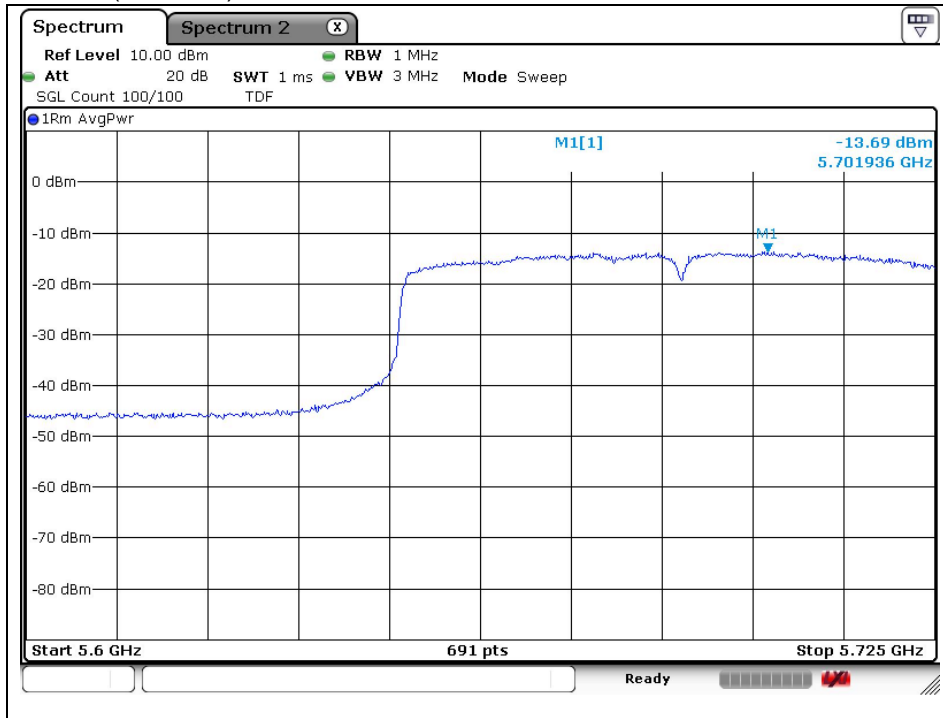


U-NII 3 11ac_VHT80 (5 690 MHz)_ANT1

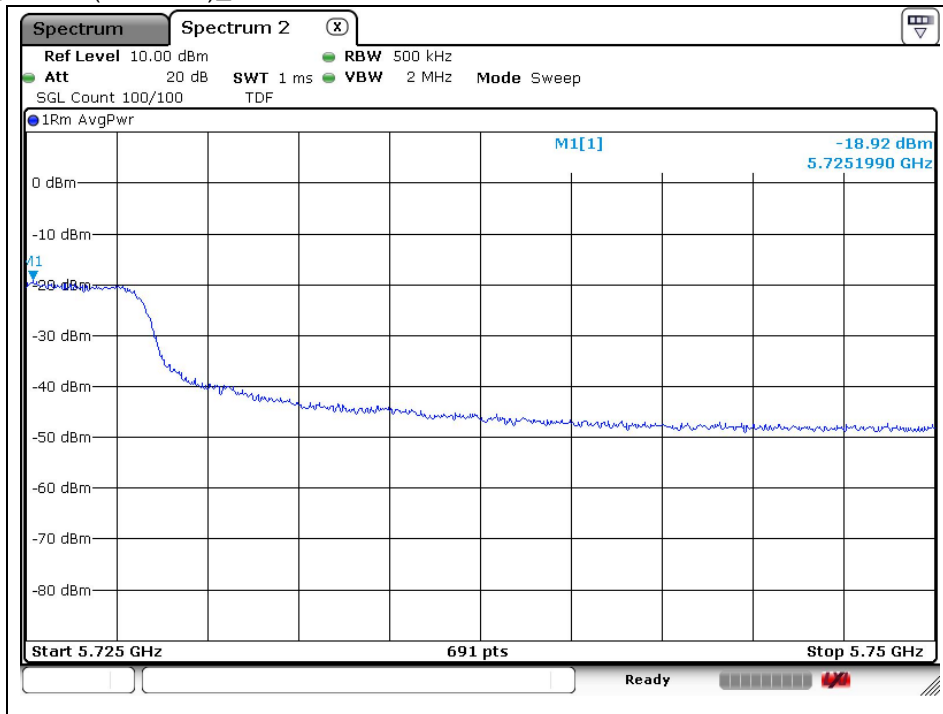


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U-NII 2C 11ac_VHT80 (5 690 MHz)_ANT2



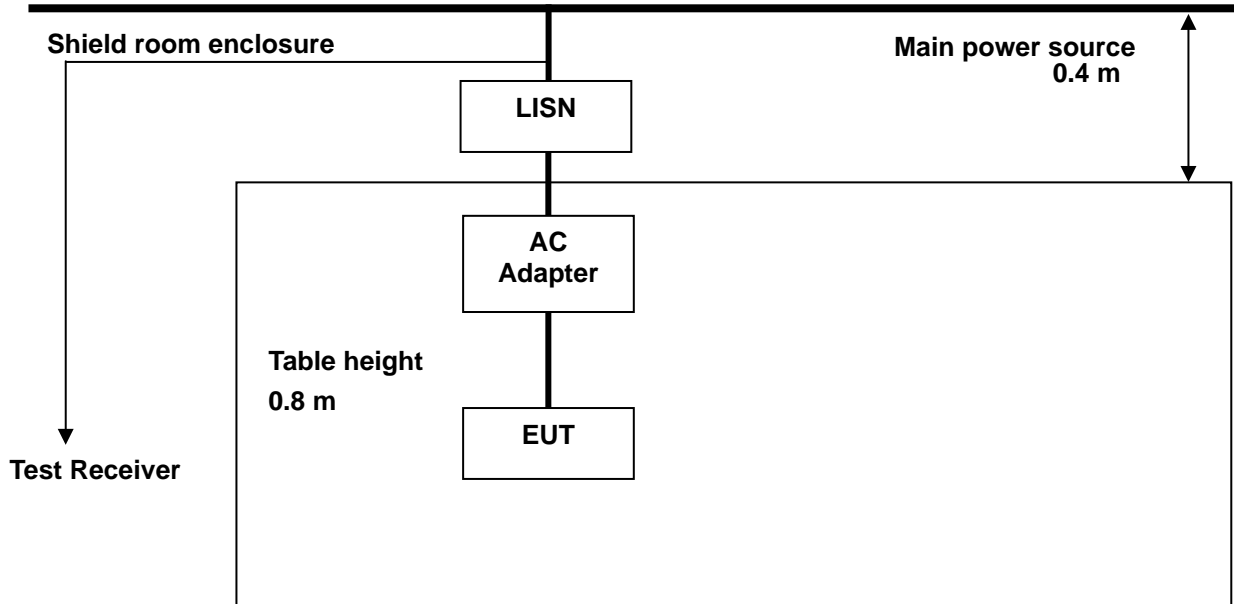
U-NII 3 11ac_VHT80 (5 690 MHz)_ANT2



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7. Transmitter AC Power Line Conducted Emission

7.1. Test Setup



7.2. Limit

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H / 50 ohms line impedance stabilization network (LISN).

Compliance with the provision of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

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7.3. Test Procedures

AC conducted emissions from the EUT were measured according to the dictates of ANSI C63.10-2013

1. The test procedure is performed in a 6.5 m × 3.5 m × 3.5 m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m (W) × 1.5 m (L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. All peripherals were connected to the second LISN and the chassis ground also bounded to the horizontal ground plane of shielded room.
4. The excess power cable between the EUT and the LISN was bundled. The power cables of peripherals were unbundled. All connecting cables of EUT and peripherals were moved to find the maximum emission.

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7.4. Test Results

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (23 ± 1) °C
 Relative humidity : 47 % R.H.
 Frequency range : 0.15 MHz - 30 MHz
 Measured Bandwidth : 9 kHz

FREQ. (MHz)	LEVEL (dB μ V)		LINE	LIMIT (dB μ V)		MARGIN (dB)	
	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.33	41.40	38.70	N	59.45	49.45	18.05	10.75
0.65	45.60	43.00	N	56.00	46.00	10.40	3.00
1.35	43.30	38.10	N	56.00	46.00	12.70	7.90
2.00	38.90	33.00	N	56.00	46.00	17.10	13.00
3.98	38.40	32.30	N	56.00	46.00	17.60	13.70
16.92	44.90	38.70	N	60.00	50.00	15.10	11.30
0.32	37.50	35.20	H	59.71	49.71	22.21	14.51
0.65	41.10	34.40	H	56.00	46.00	14.90	11.60
0.69	39.20	32.30	H	56.00	46.00	16.80	13.70
1.33	37.00	31.50	H	56.00	46.00	19.00	14.50
12.44	33.90	28.50	H	60.00	50.00	26.10	21.50
16.78	43.80	37.30	H	60.00	50.00	16.20	12.70

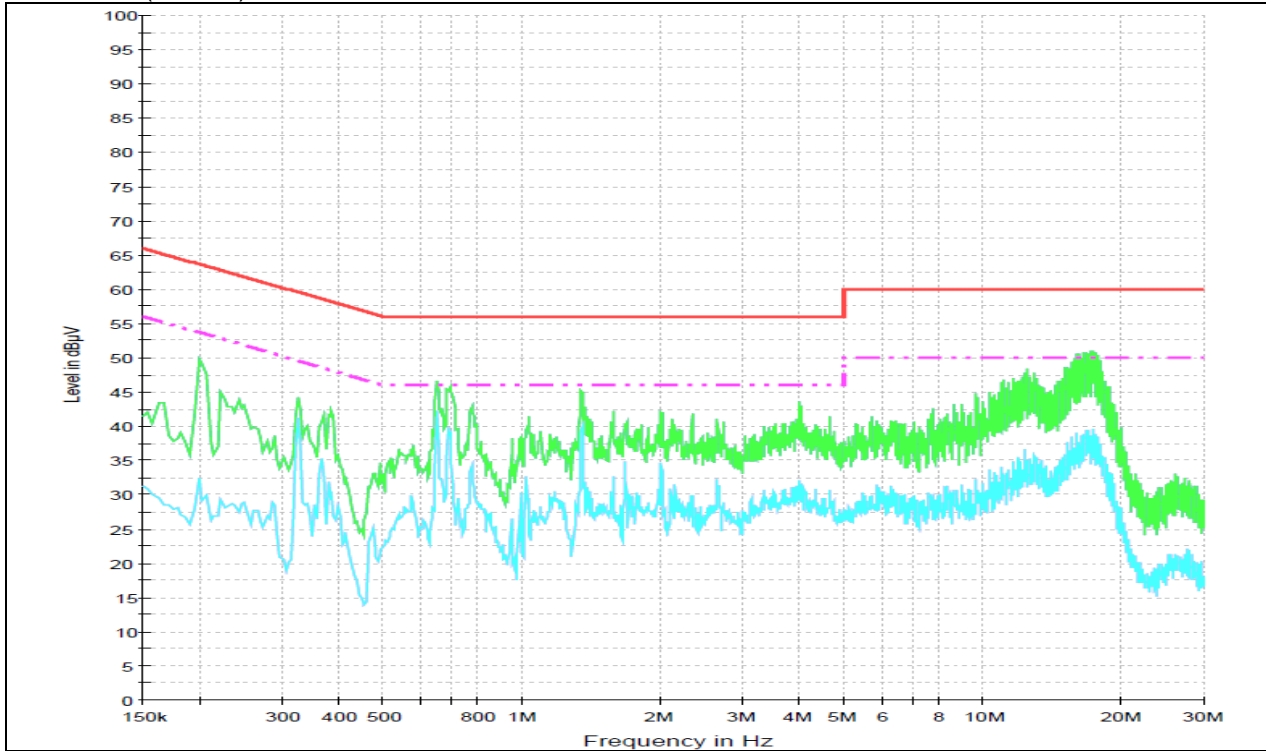
Remark;

- Line (H): Hot, Line (N): Neutral.
- All modes of operation were investigated and the worst-case emissions were reported using **11a (Band 2C) / 6Mbps / Low channel.**
- The limit for Class B device(s) from 150 kHz to 30 MHz are specified in Section of the Title 47 CFR.
- Traces shown in plot were made by using a peak detector and average detector.
- Deviations to the Specifications: None.

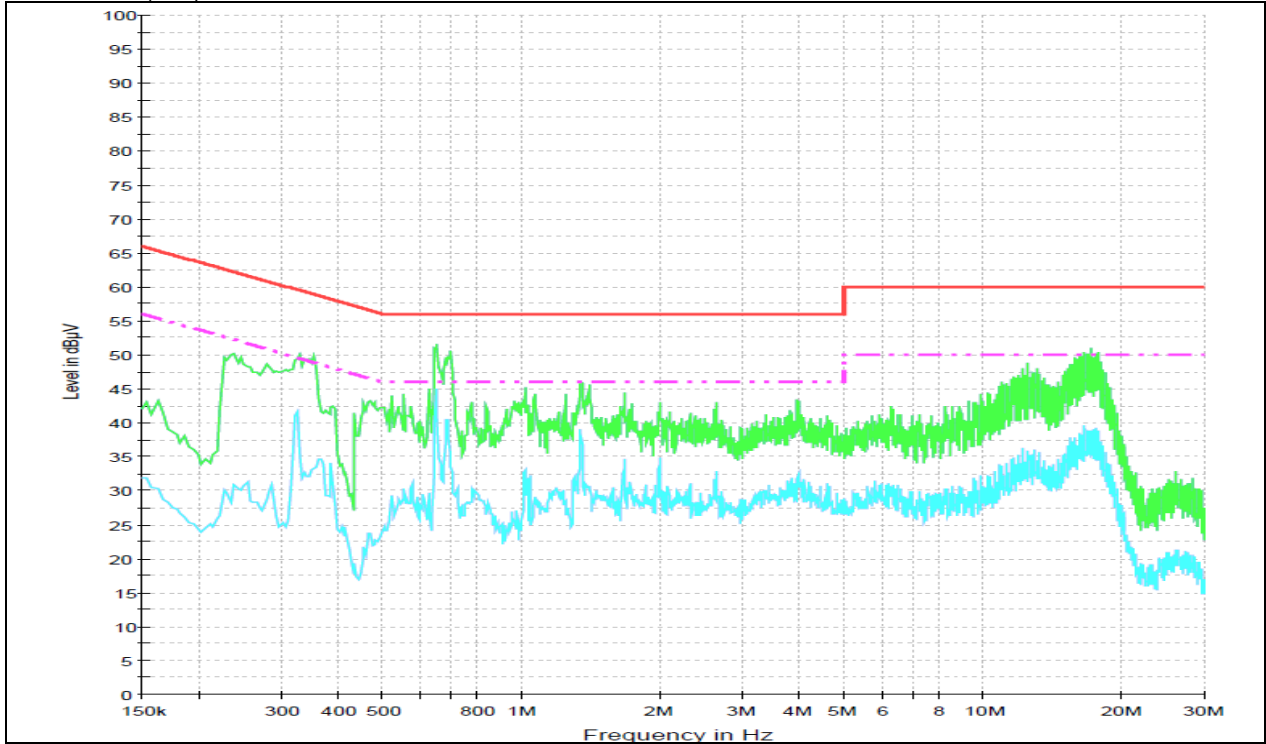
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Test mode: (Neutral)



Test mode: (Hot)



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8. Antenna Requirement

8.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section §15.407 (a) if transmitting antennas of directional gain greater than 6 dB i are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dB i.

8.2. Antenna Connected Construction

Antenna used in this product is PIFA Antenna and peak max gain of antenna as below.

Band	5 180 MHz – 5 240 MHz	5 260 MHz – 5 320 MHz	5 500 MHz – 5 720 MHz	5 725 MHz – 5 825 MHz
Mode	11a/n_HT20, HT40, 11ac_VHT20, VHT40, VHT80			
ANT1 Gain	1.10 dB i	1.60 dB i	1.10 dB i	0.60 dB i
ANT2 Gain	-0.10 dB i	1.90 dB i	2.40 dB i	3.00 dB i
ANT1+ANT2 Gain	3.53 dB i	4.76 dB i	4.78 dB i	4.89 dB i

Unequal antenna gains, with equal transmit powers. For antenna gains given by G_1, G_2, \dots, G_N dB i

(i) If transmit signals are correlated, then

Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}]$ dB i [Note the “20”s in the denominator of each exponent and the square of the sum of terms; the object is to combine the signal levels coherently.]

- End of the Test Report -

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RTT5041-19(2019.04.24)(1)

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A4(210 mm x 297 mm)