

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
www.kctl.co.kr

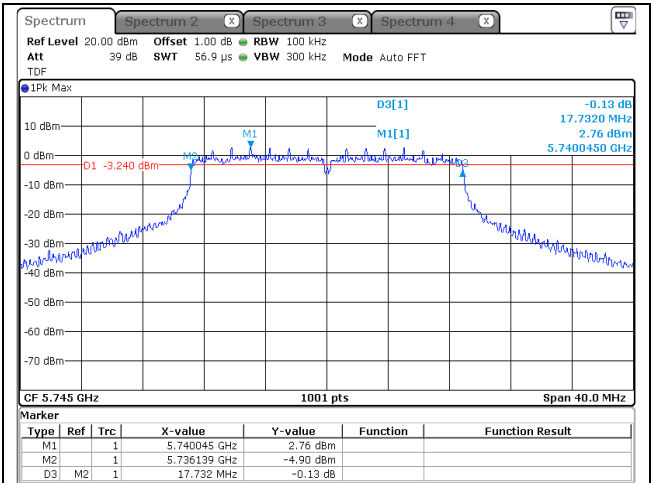
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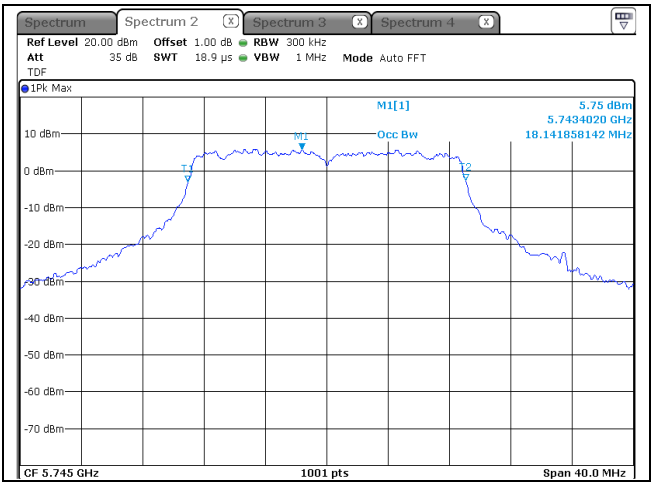
- 802.11ac VHT20

- 5 745 MHz

EBW



OBW



KCTL Inc.

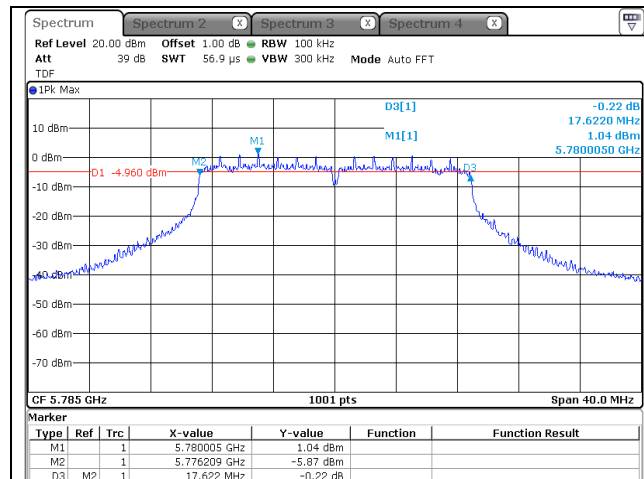
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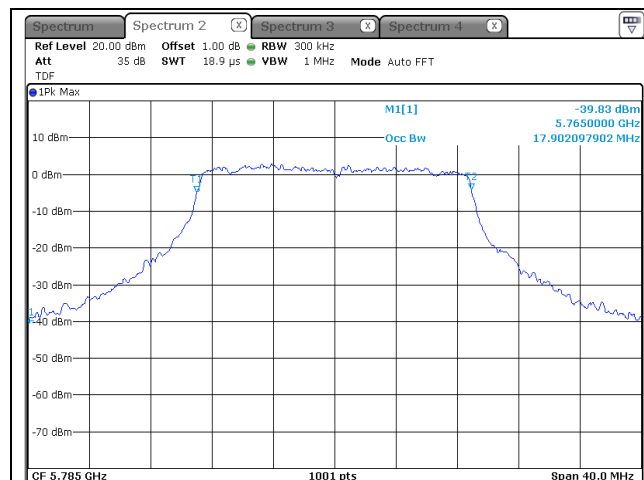


- 5 785 MHz

EBW



OBW



KCTL Inc.

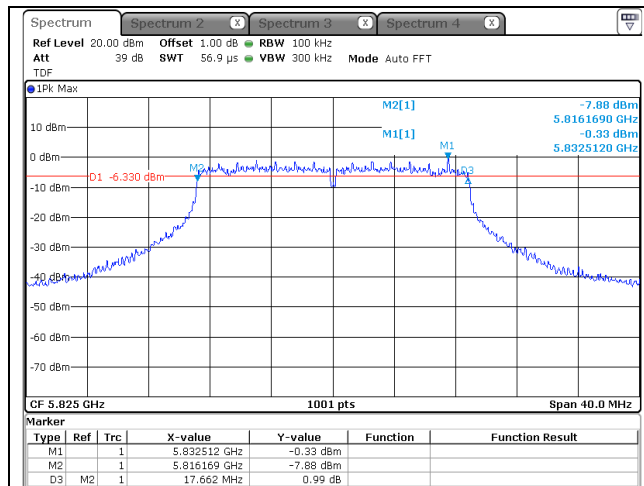
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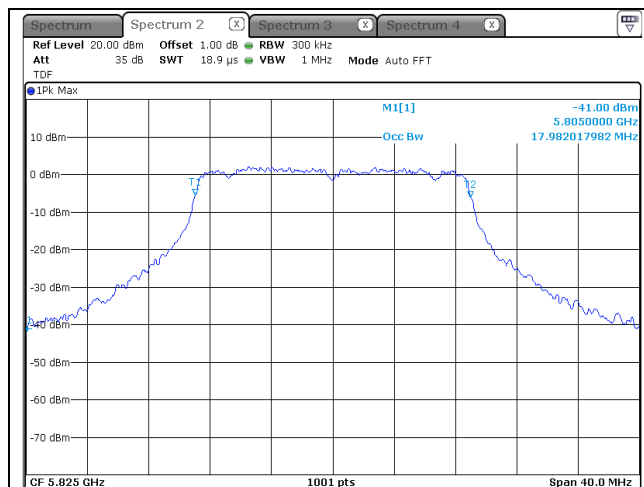


- 5 825 MHz

EBW



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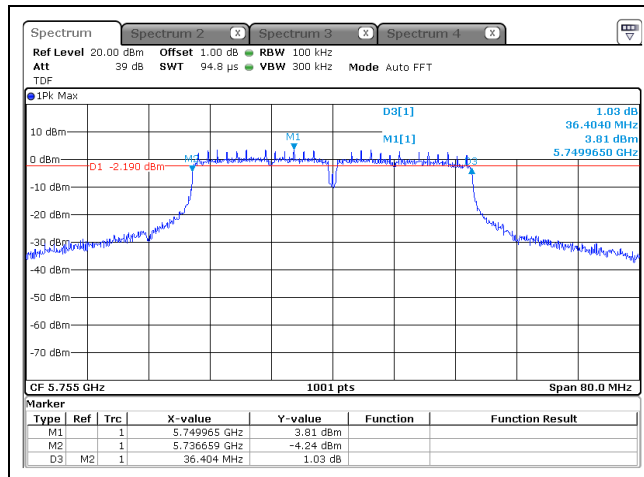
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KCTL

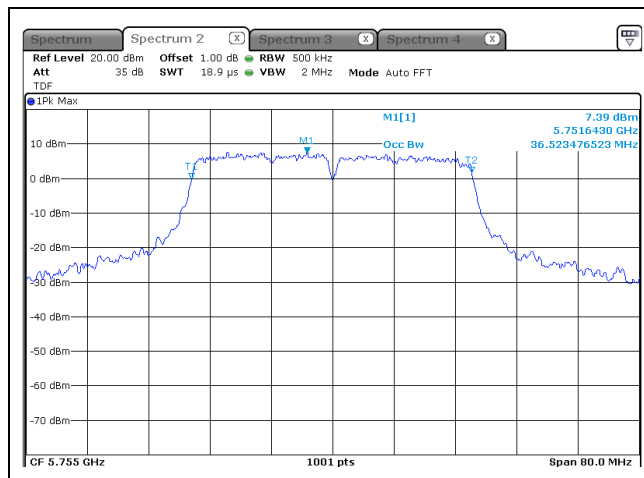
- 802.11n HT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

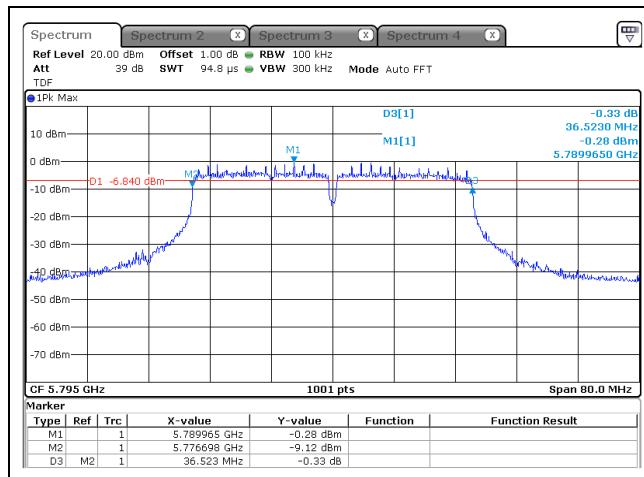
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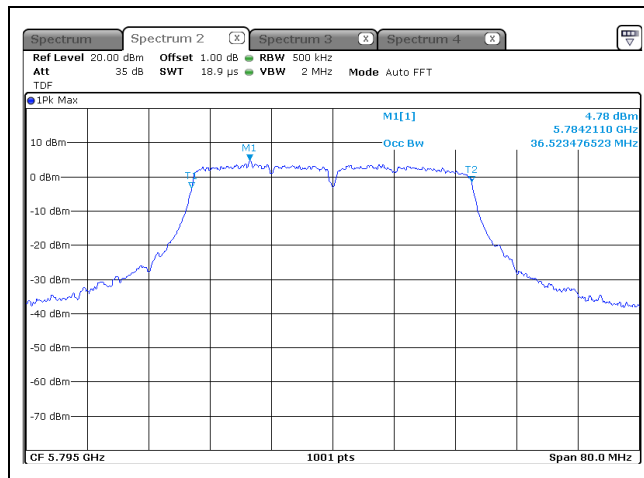


- 5 795 MHz

EBW



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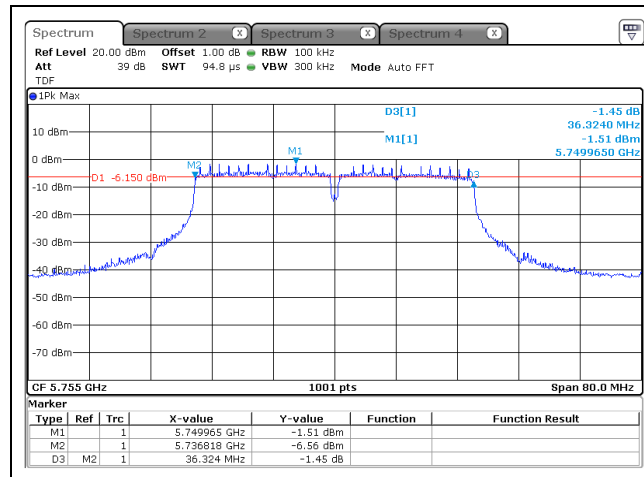
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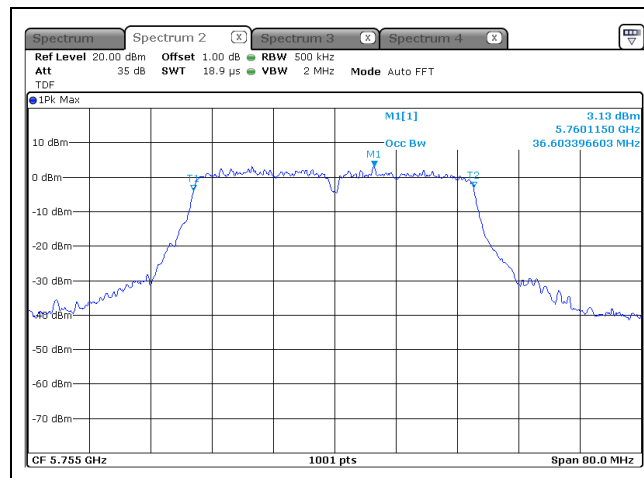
- 802.11ac VHT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

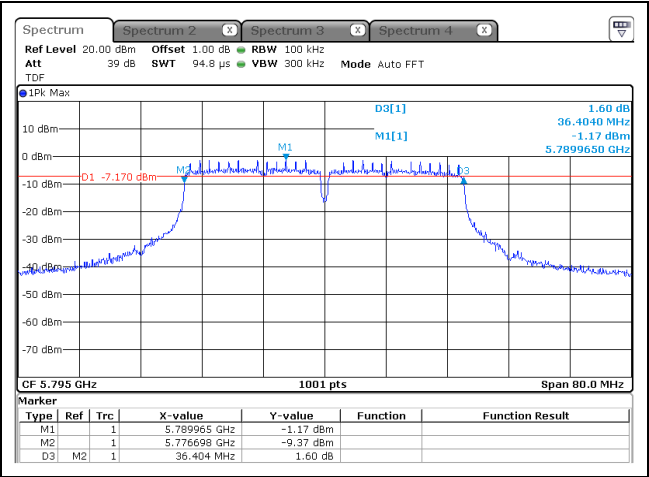
65, Sinwon-ro, Yeongtong-gu,
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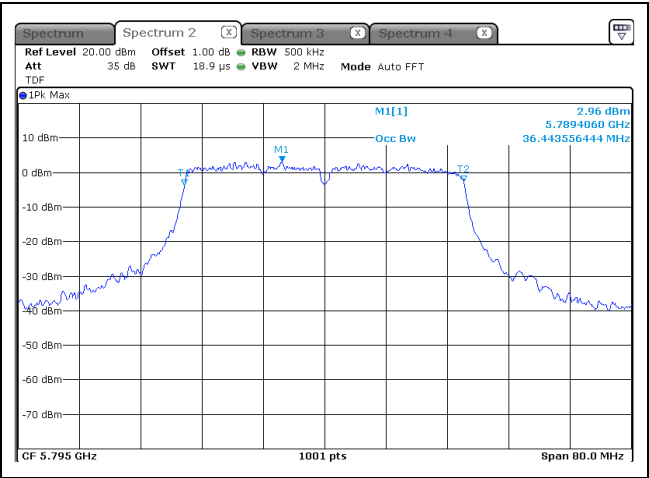


- 5 795 MHz

EBW



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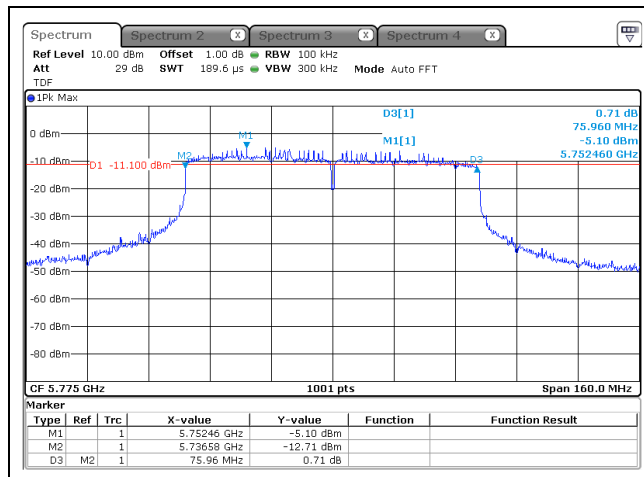
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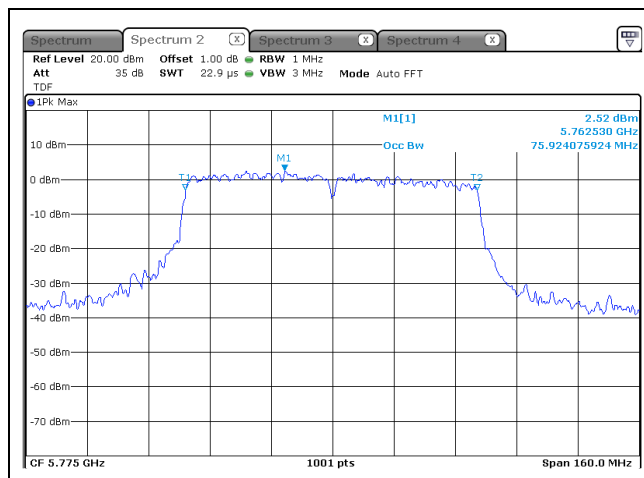
- 802.11ac VHT80

- 5 775 MHz

EBW



OBW



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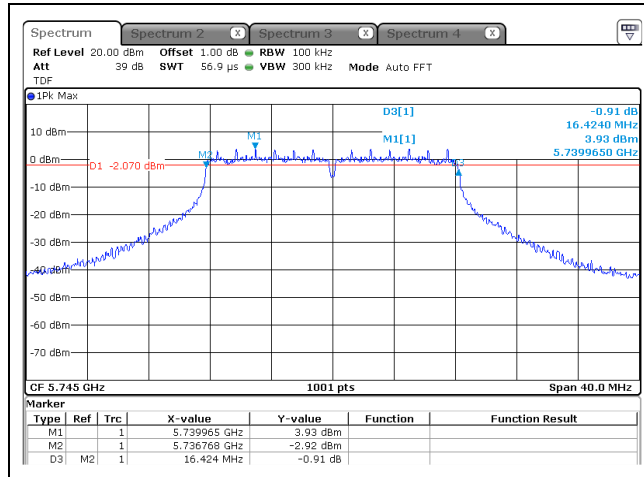


Ant 3

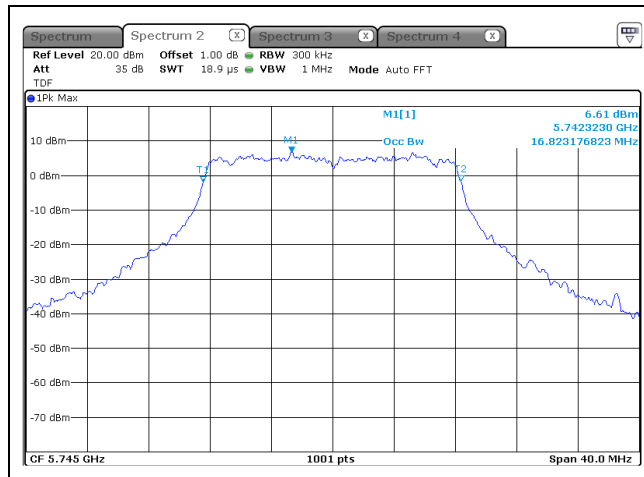
- 802.11a

- 5 745 MHz

EBW



OBW



KCTL Inc.

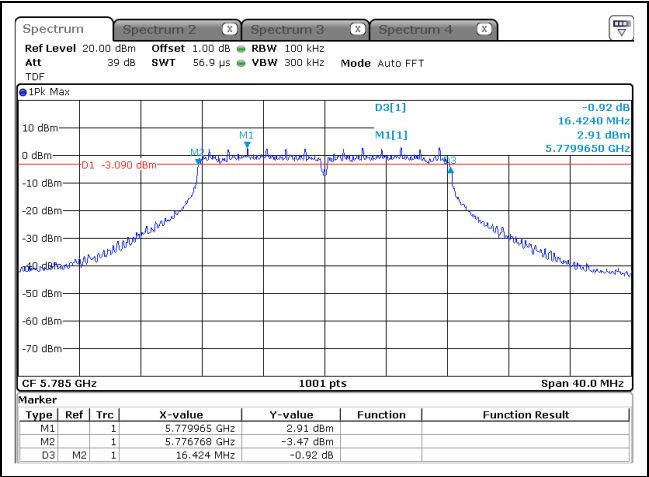
65, Sinwon-ro, Yeongtong-gu,
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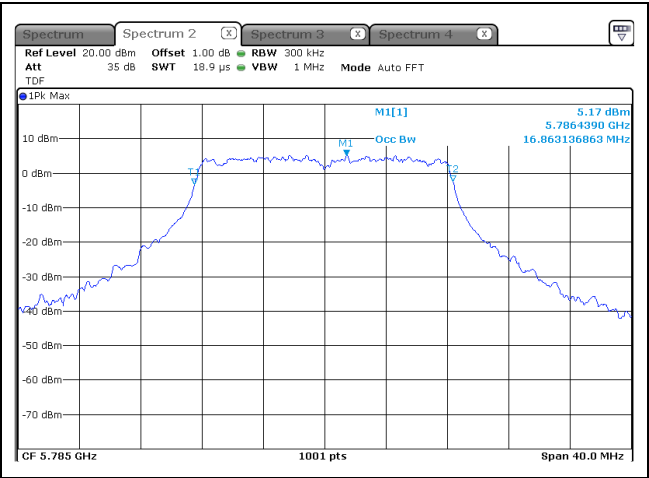
KCTL

- 5 785 MHz

EBW



OBW



KCTL Inc.

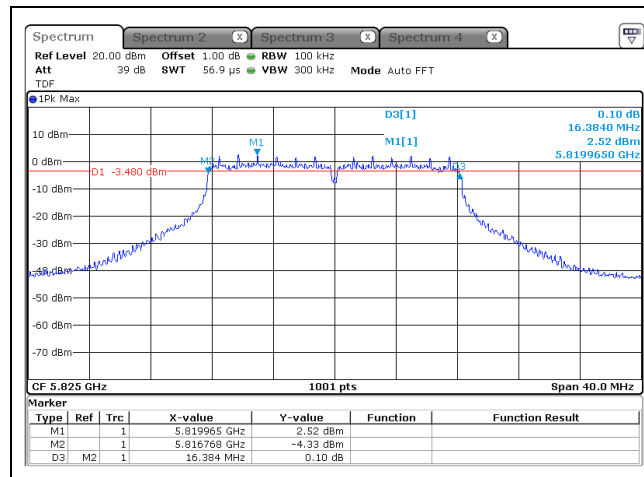
65, Sinwon-ro, Yeongtong-gu,
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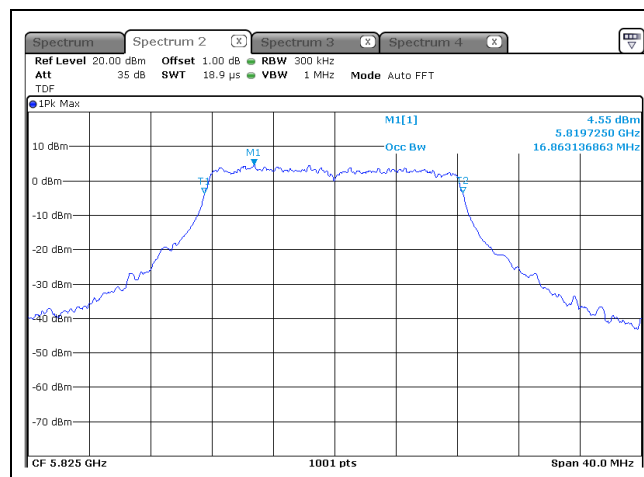


- 5 825 MHz

EBW



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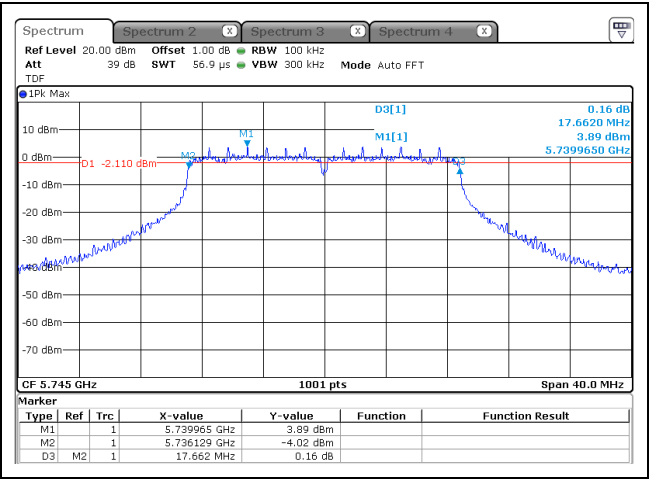
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KCTL

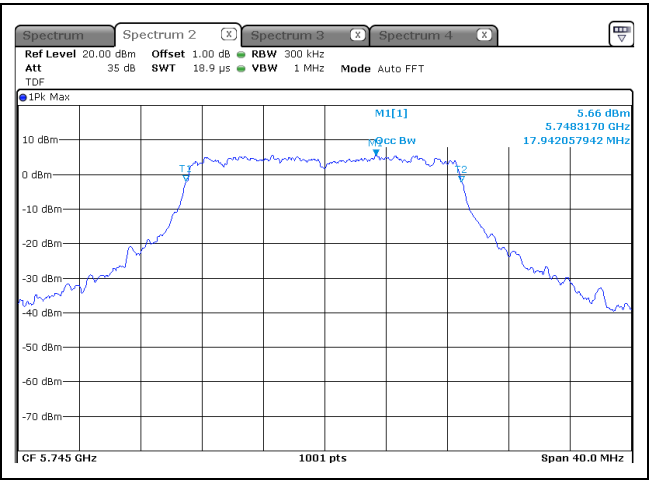
- 802.11n HT20

- 5 745 MHz

EBW



OBW



KCTL Inc.

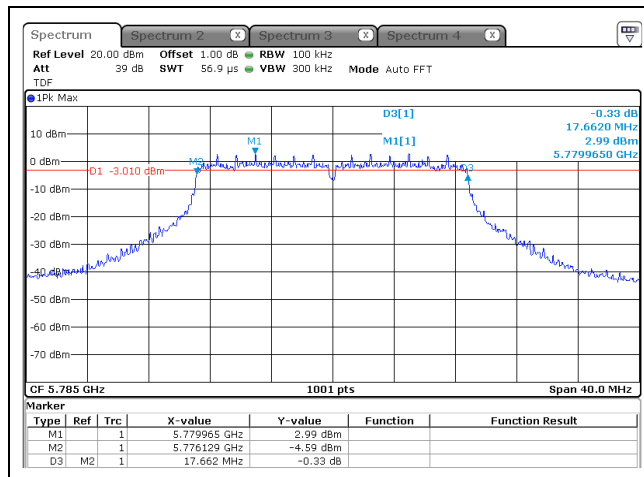
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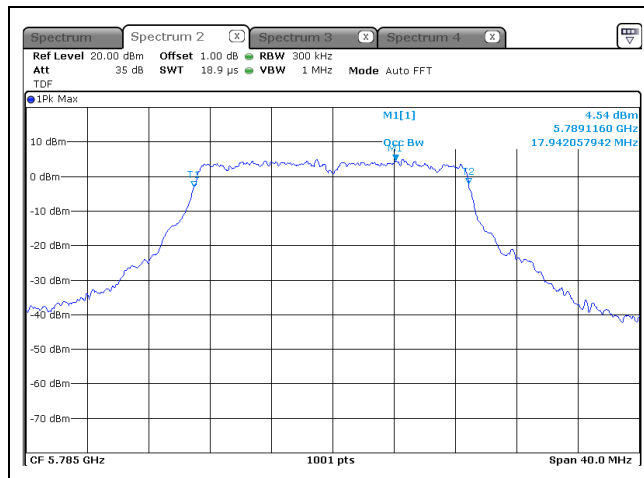


- 5 785 MHz

EBW



OBW



KCTL Inc.

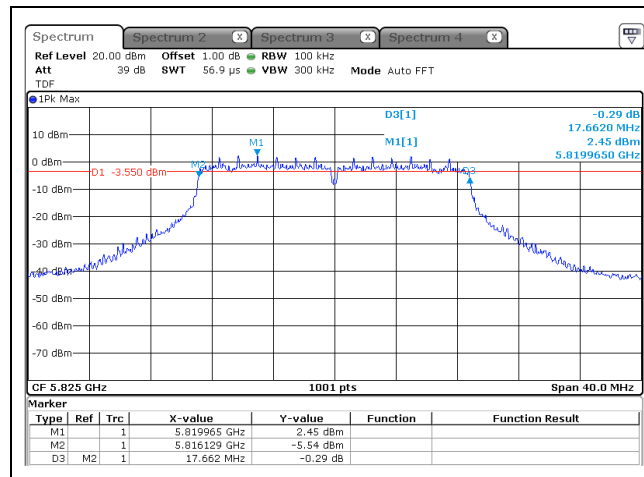
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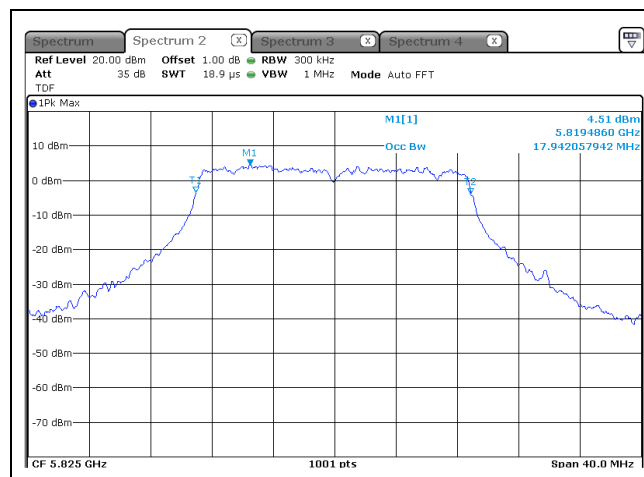


- 5 825 MHz

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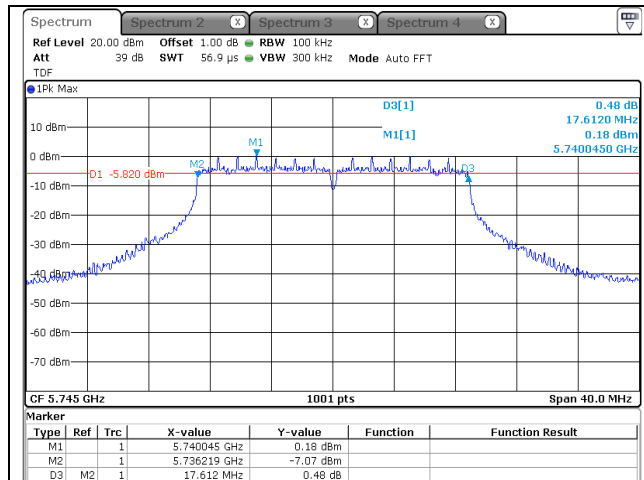
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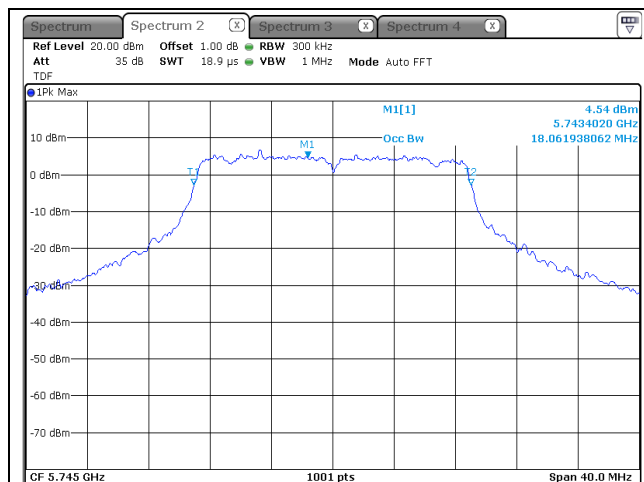
- 802.11ac VTH20

- 5 745 MHz

EBW



OBW



KCTL Inc.

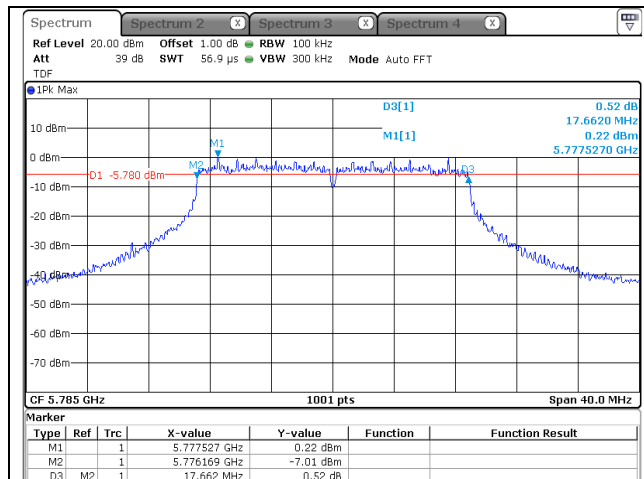
65, Sinwon-ro, Yeongtong-gu,
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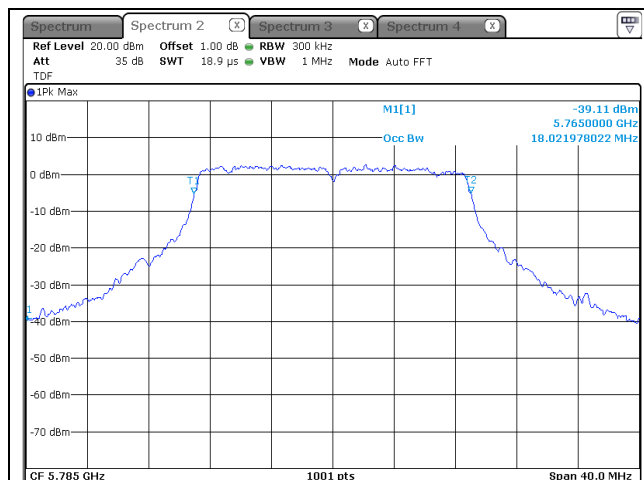


- 5 785 MHz

EBW



OBW



KCTL Inc.

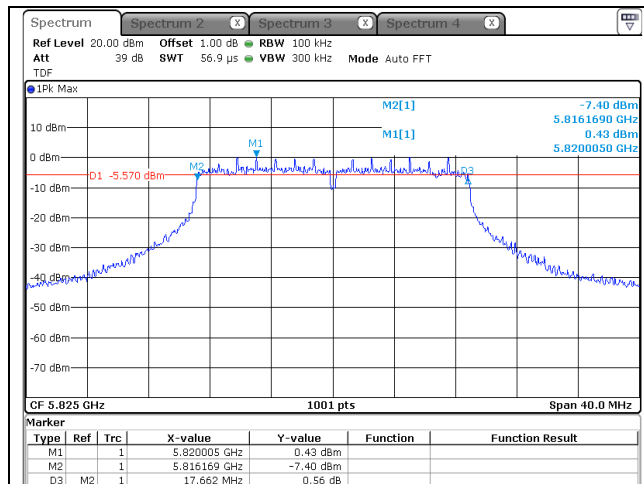
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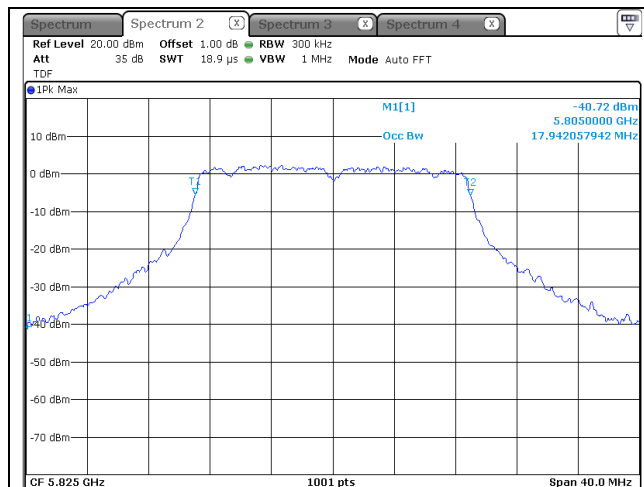


- 5 825 MHz

EBW



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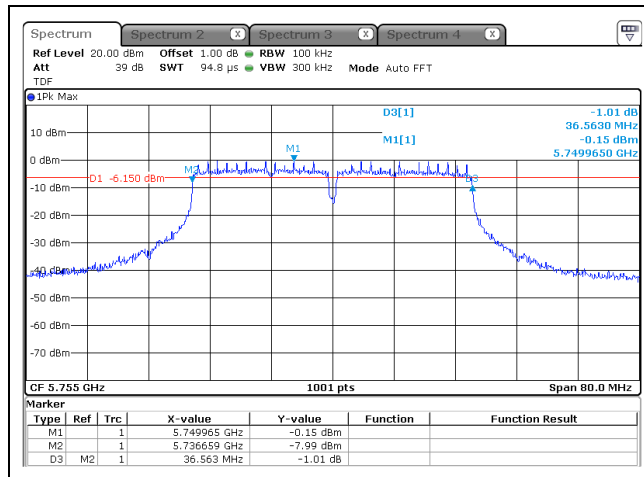
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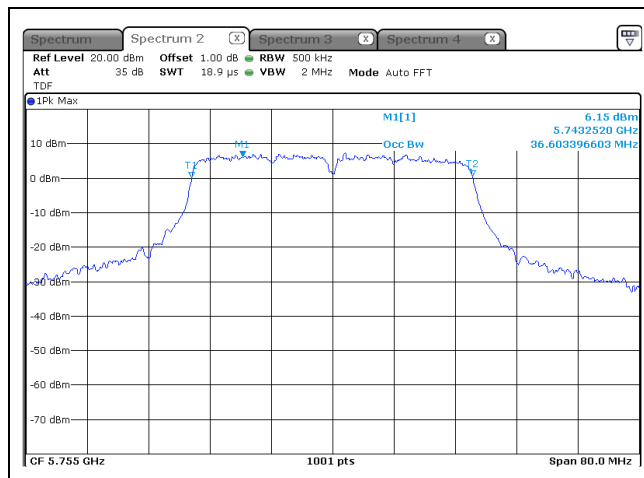
- 802.11n HT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

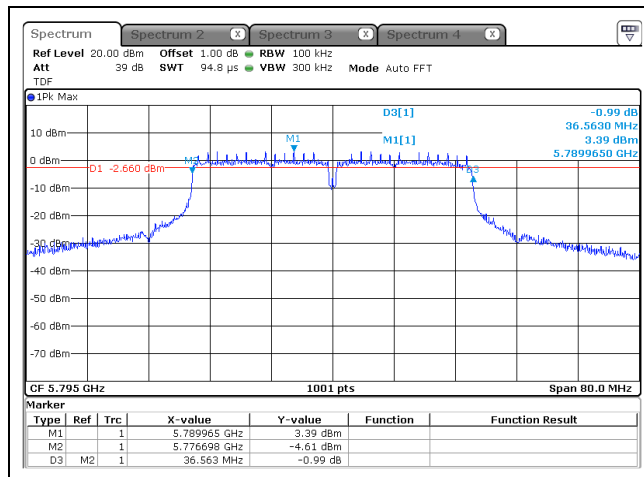
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TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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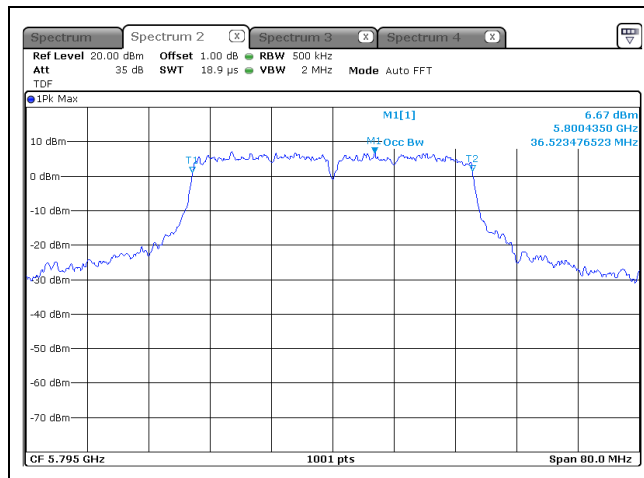


- 5 795 MHz

EBW



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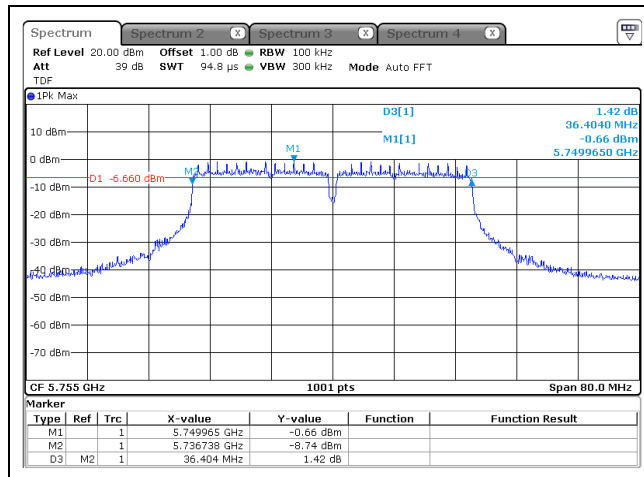
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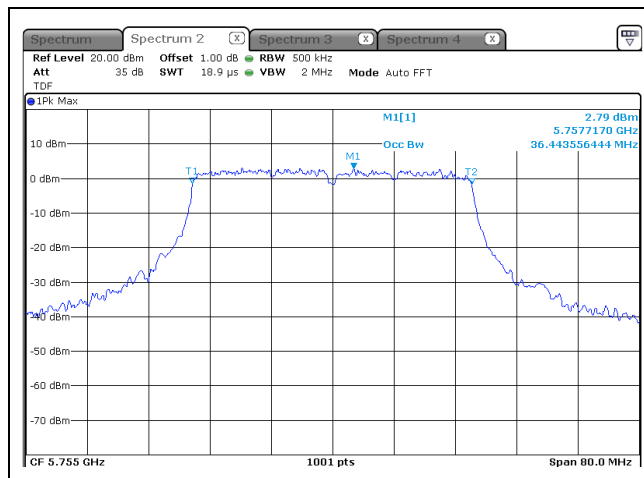
- 802.11ac VHT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

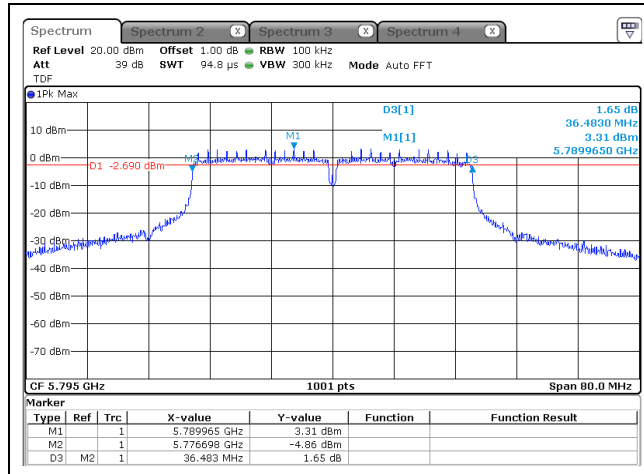
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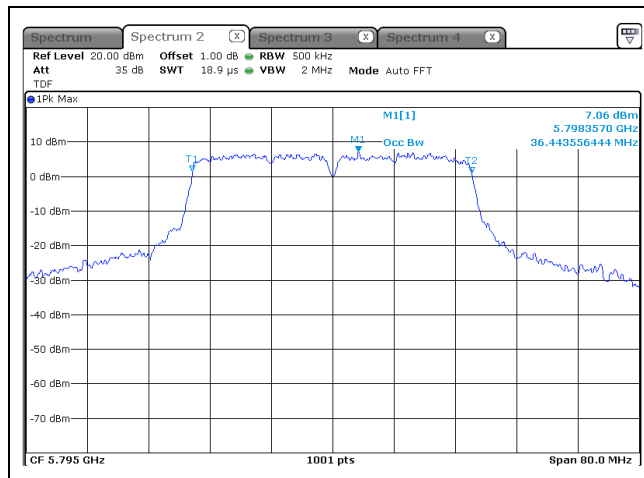


- 5 795 MHz

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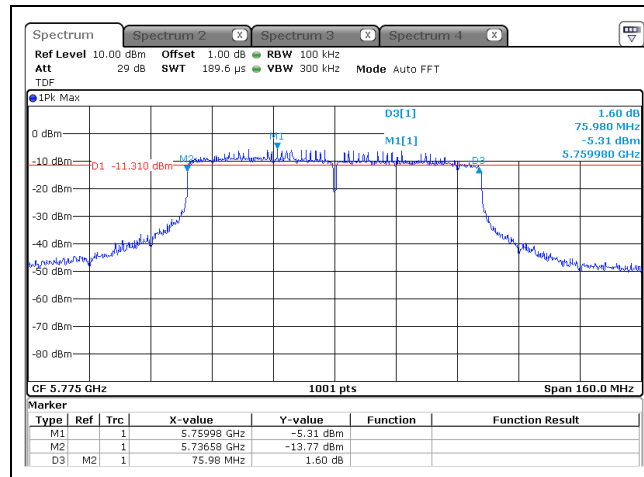
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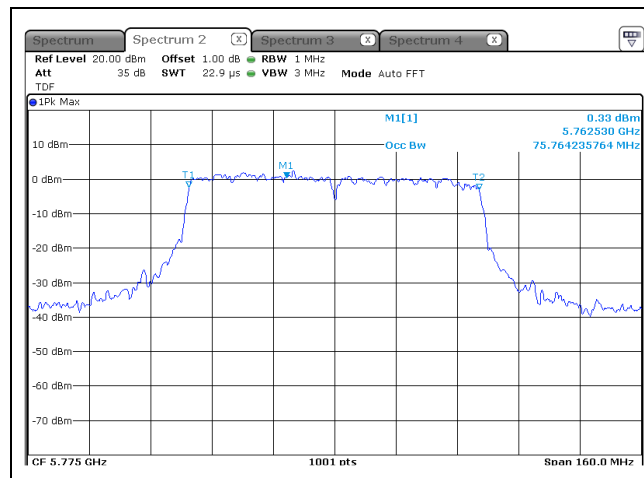
- 802.11ac VHT80

- 5 775 MHz

EBW



OBW



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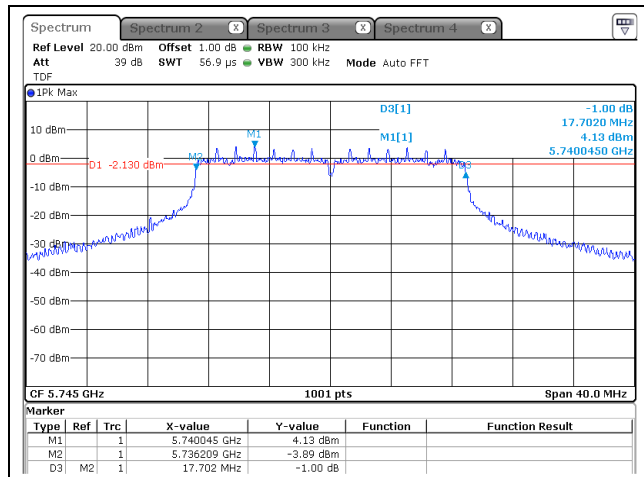
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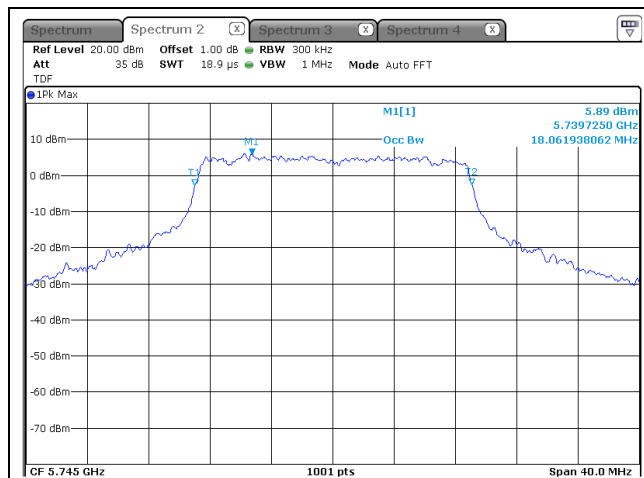
- 802.11n HT20_ MIMO (ANT 1+2)

- 5 745 MHz

EBW

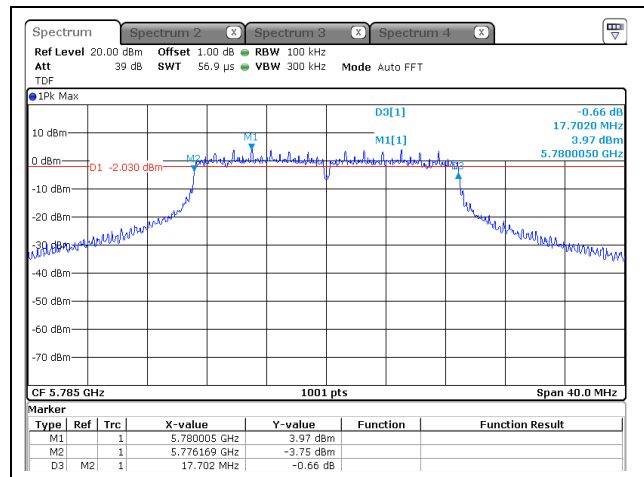


OBW

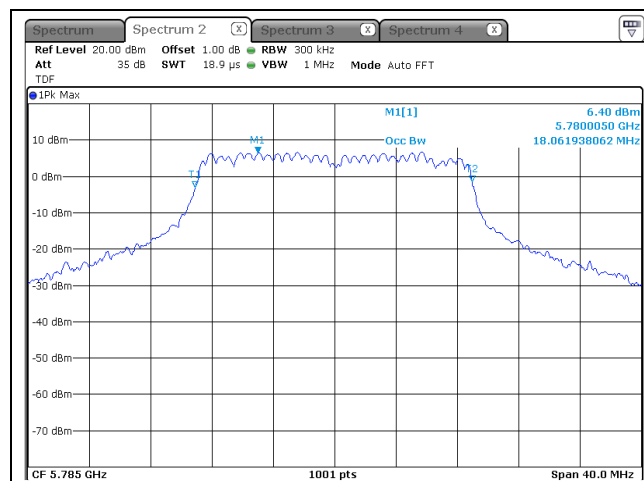


- 5 785 MHz

EBW

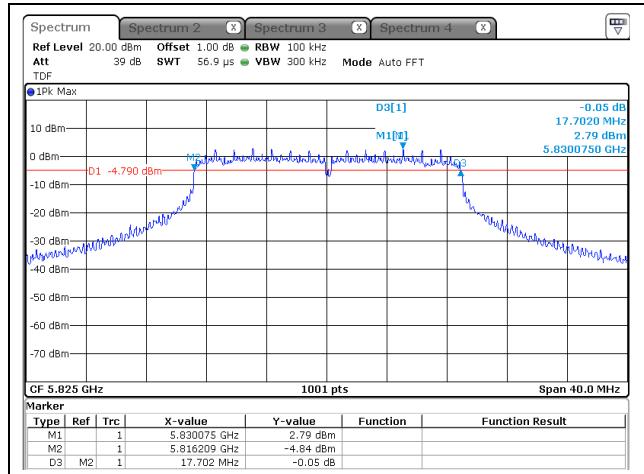


OBW

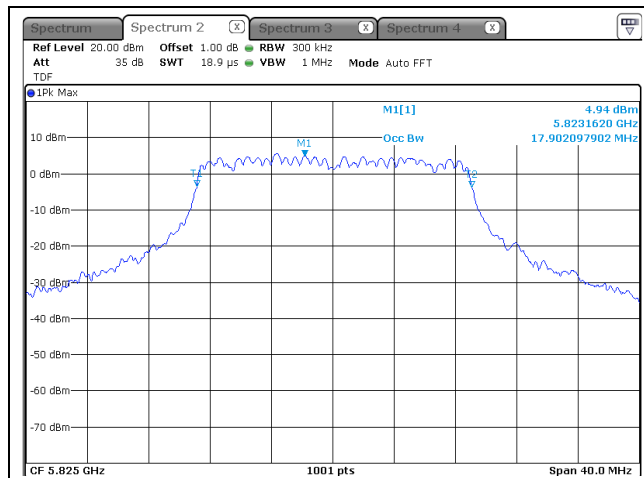


- 5 825 MHz

EBW



OBW



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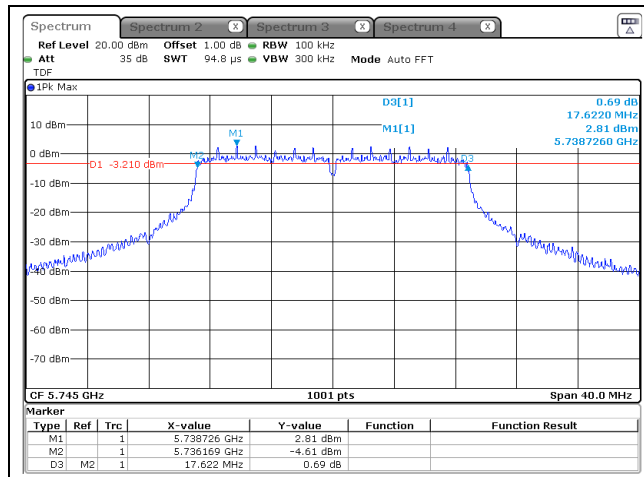
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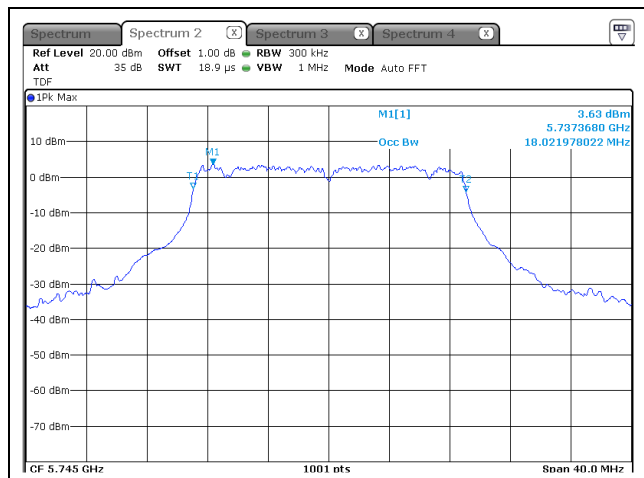
- 802.11ac VTH20_ MIMO (ANT 1+2)

- 5 745 MHz

EBW

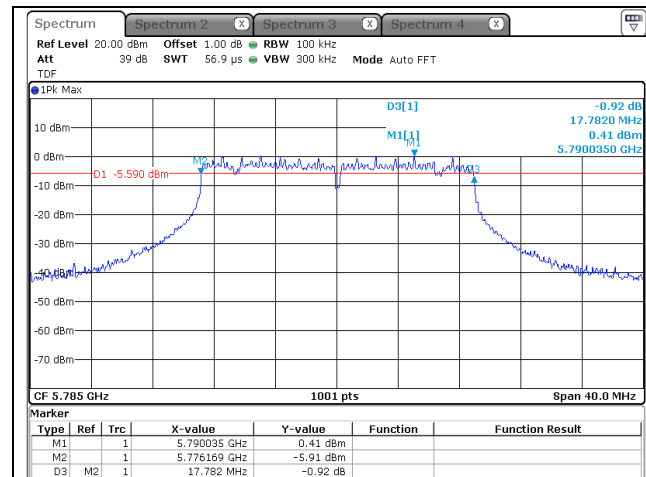


OBW

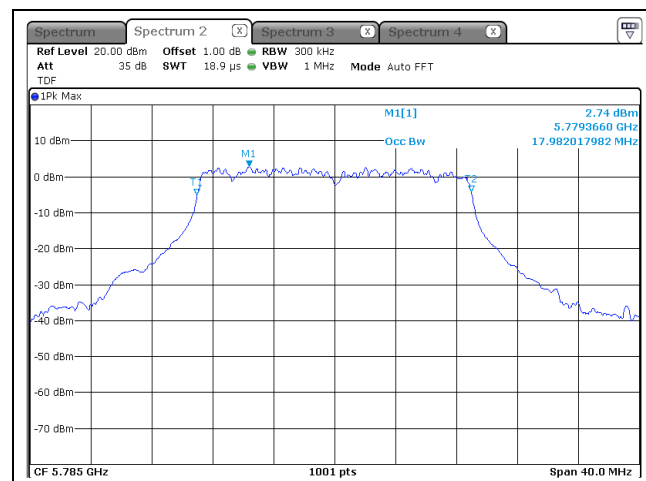


- 5 785 MHz

EBW



OBW



KCTL Inc.

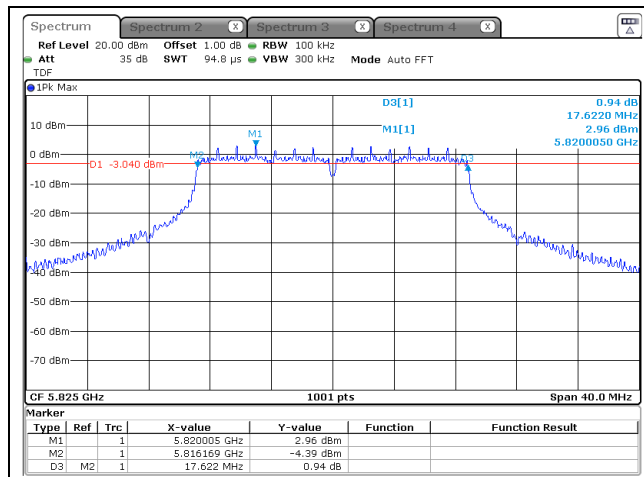
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
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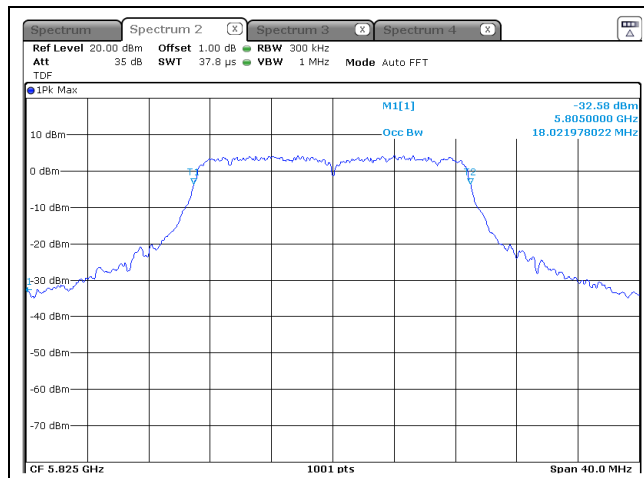


- 5 825 MHz

EBW



OBW



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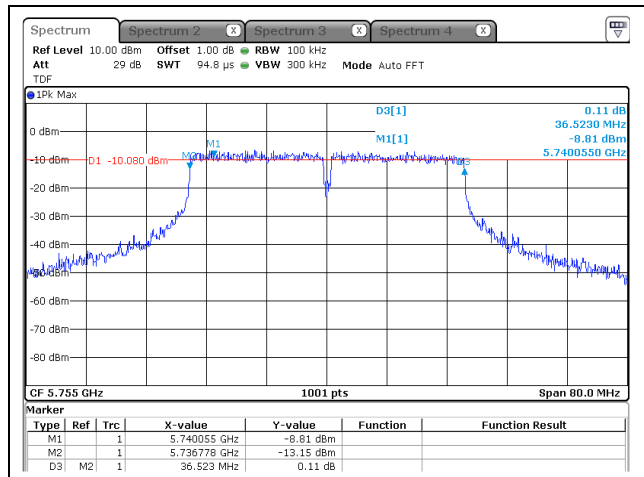
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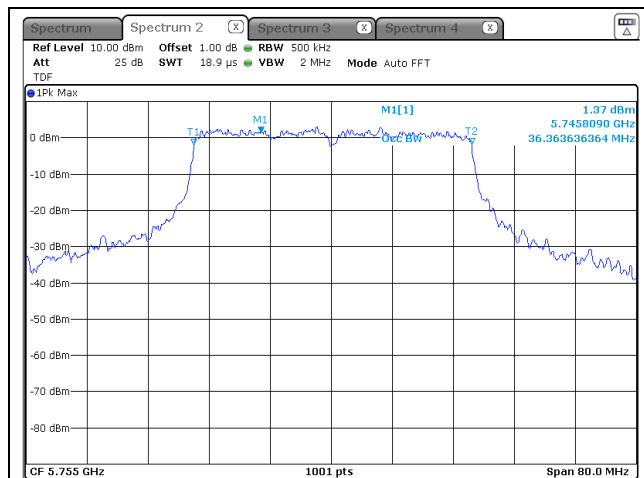
- 802.11n HT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

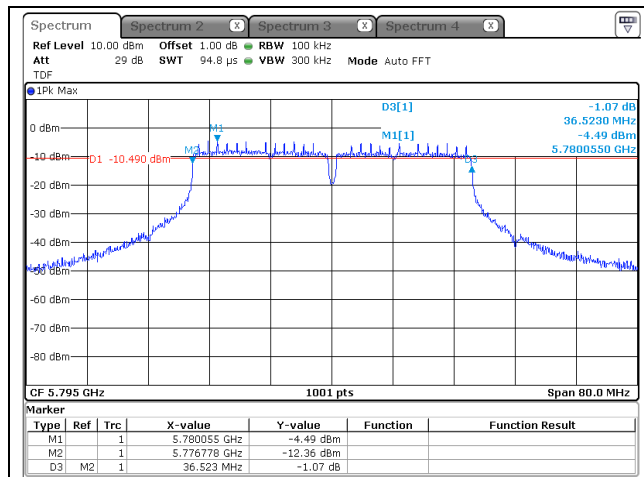
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Suwon-si, Gyeonggi-do, 443-390, Korea
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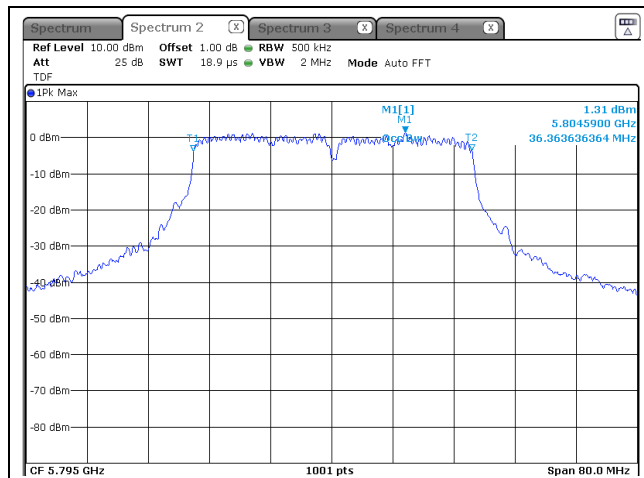


- 5 795 MHz

EBW



OBW



KCTL Inc.

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Suwon-si, Gyeonggi-do, 443-390, Korea
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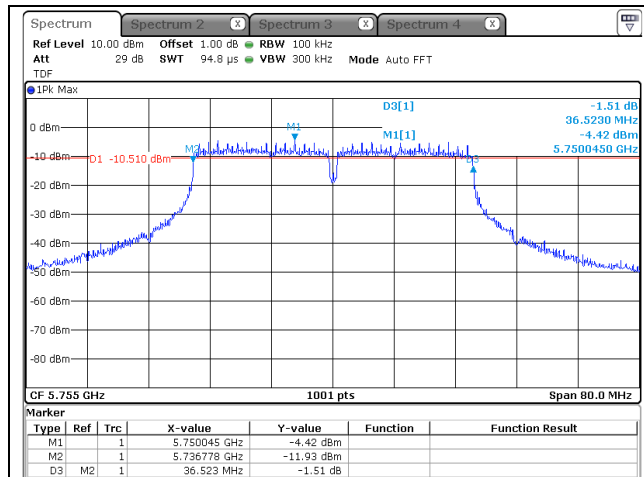
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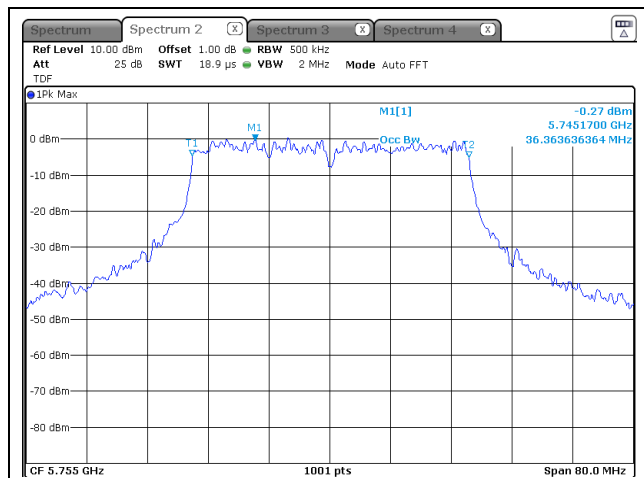
- 802.11ac VHT40

- 5 755 MHz

EBW



OBW



KCTL Inc.

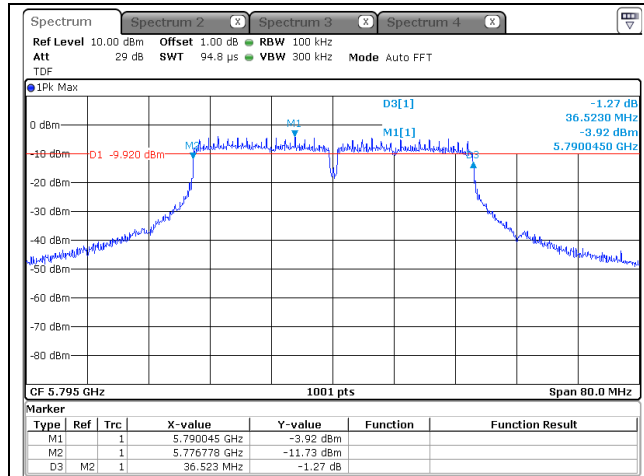
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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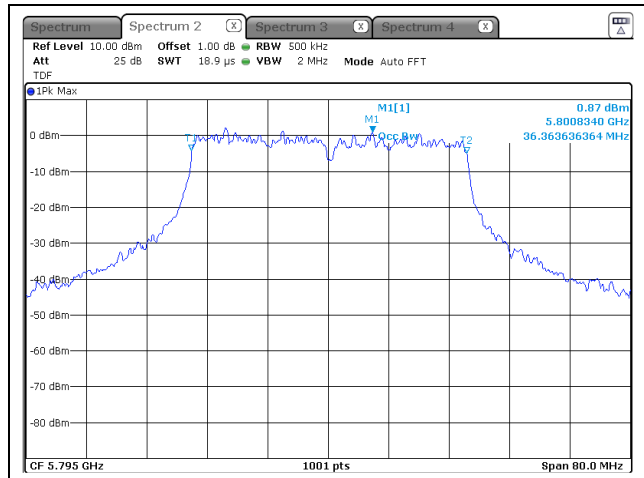


- 5 795 MHz

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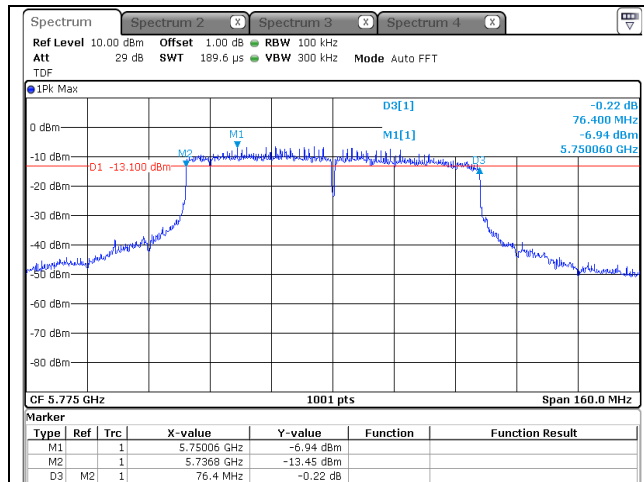
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KCTL

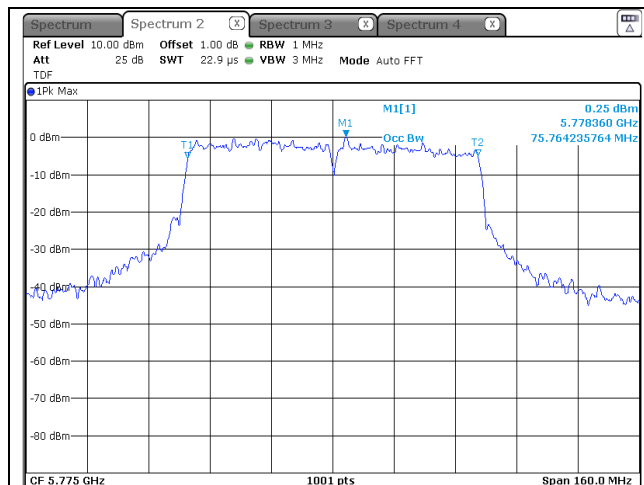
- 802.11ac VHT80

- 5 775 MHz

EBW



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Suwon-si, Gyeonggi-do, 443-390, Korea
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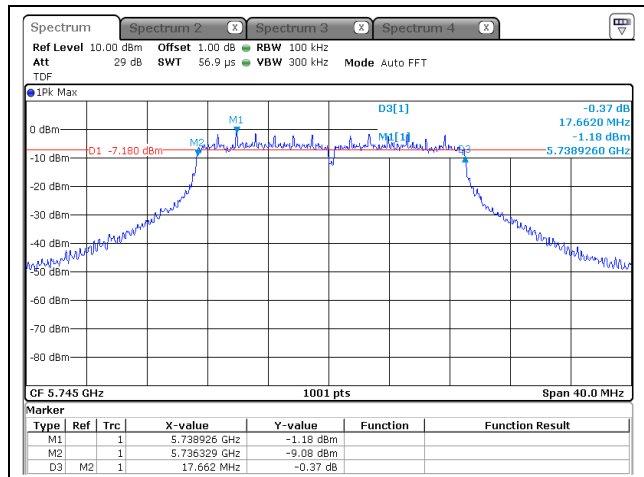
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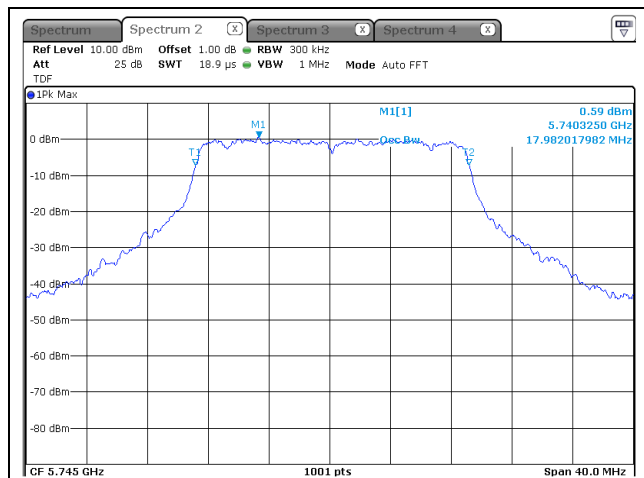
- 802.11n HT20_ MIMO (ANT 1+2+3)

- 5 745 MHz

EBW



OBW



KCTL Inc.

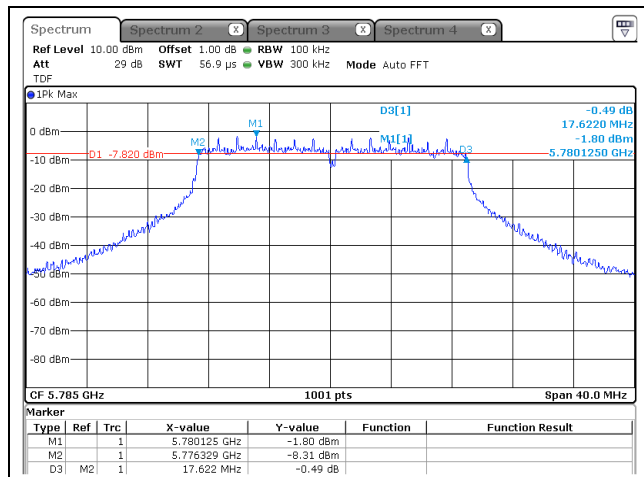
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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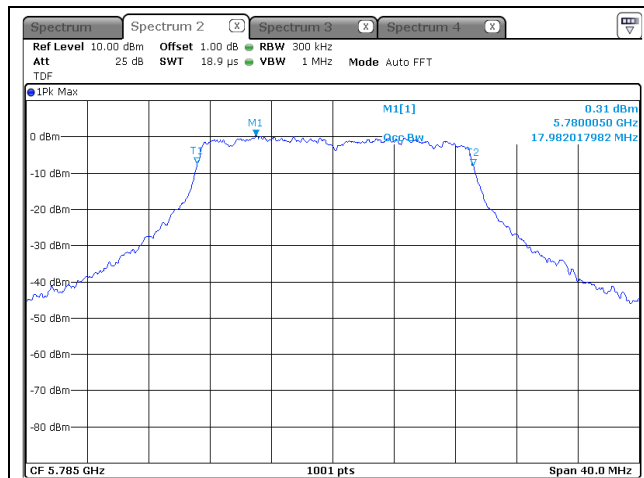


- 5 785 MHz

EBW



OBW



KCTL Inc.

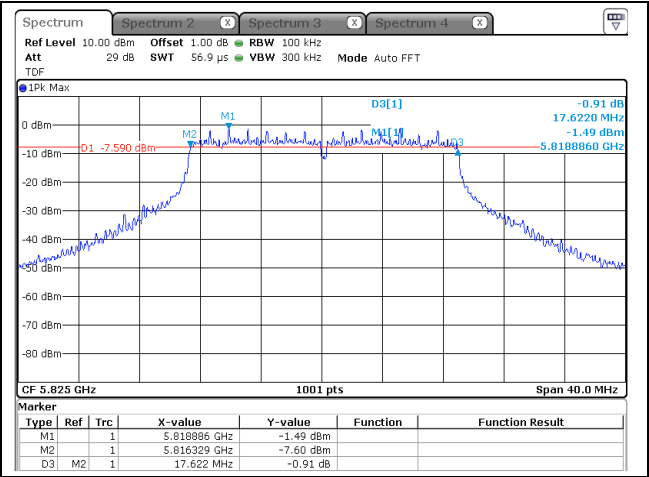
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Suwon-si, Gyeonggi-do, 443-390, Korea
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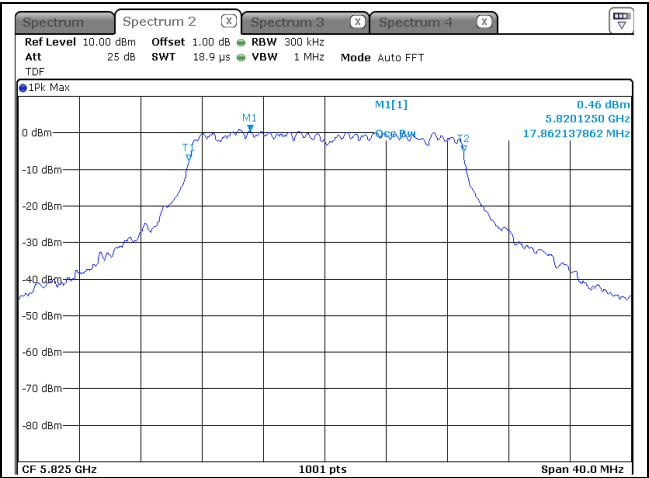
KCTL

- 5 825 MHz

EBW



OBW



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Suwon-si, Gyeonggi-do, 443-390, Korea
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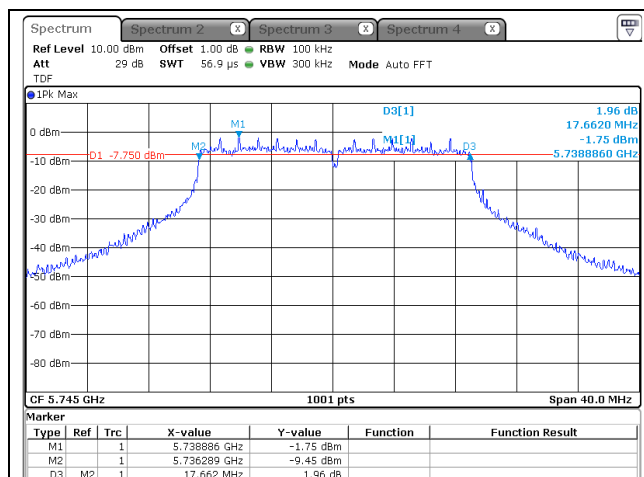
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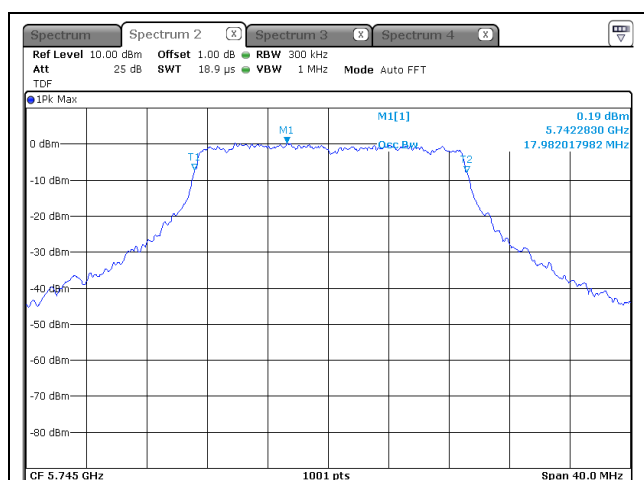
- 802.11ac VTH20_ MIMO (ANT 1+2+3)

- 5 745 MHz

EBW



OBW



KCTL Inc.

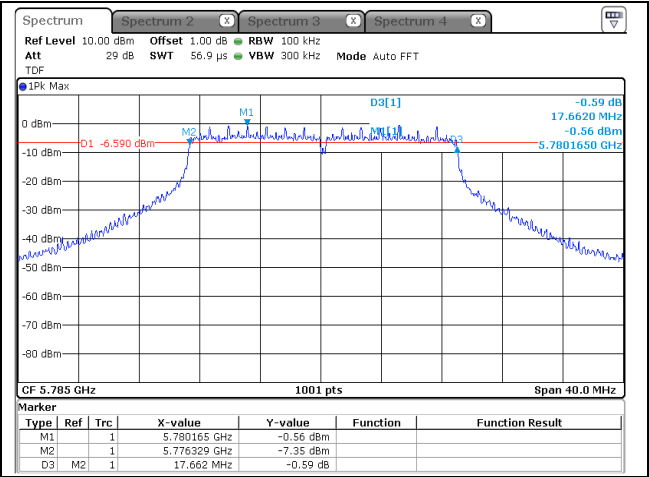
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Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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Report No.:
KR16-SRF0013
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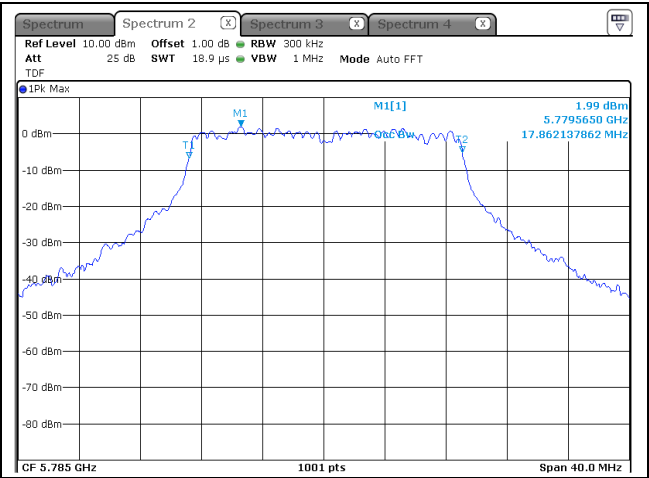
KCTL

- 5 785 MHz

EBW



OBW



KCTL Inc.

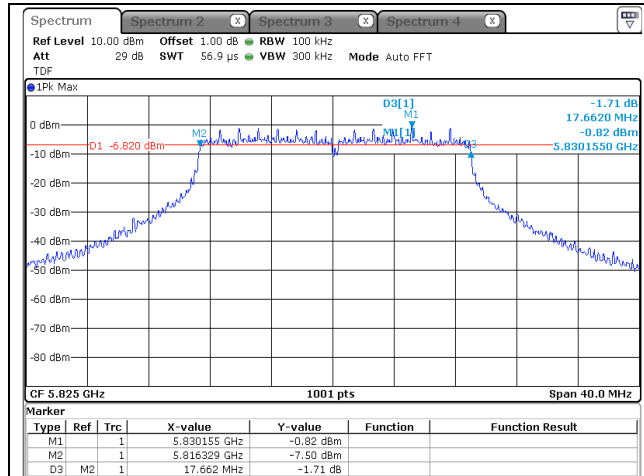
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
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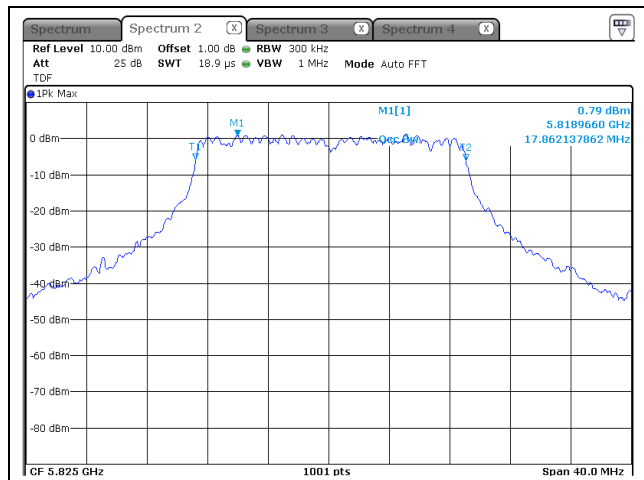


- 5 825 MHz

EBW



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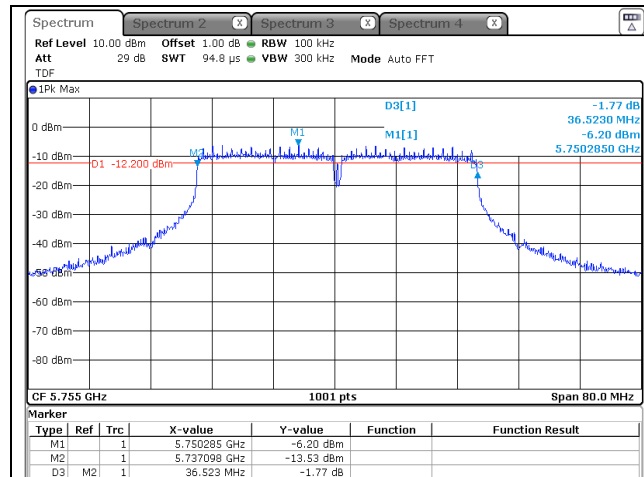
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KCTL

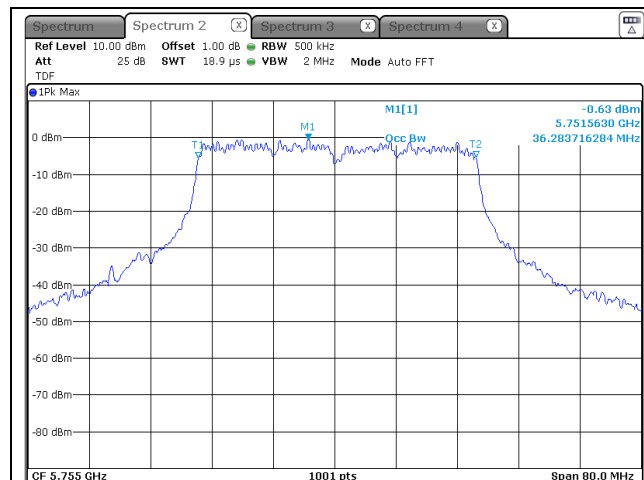
- 802.11n HT40_ MIMO (ANT 1+2+3)

- 5 755 MHz

EBW



OBW



KCTL Inc.

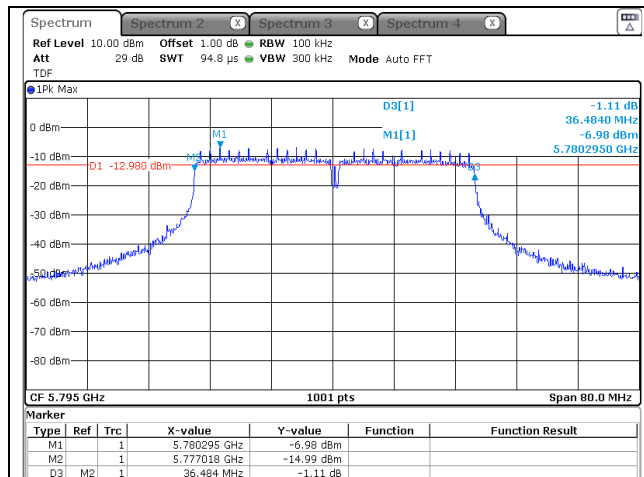
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TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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KR16-SRF0013
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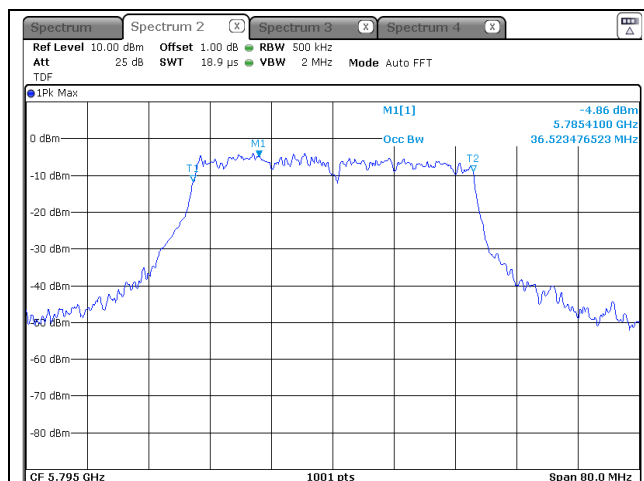


- 5 795 MHz

EBW



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Suwon-si, Gyeonggi-do, 443-390, Korea
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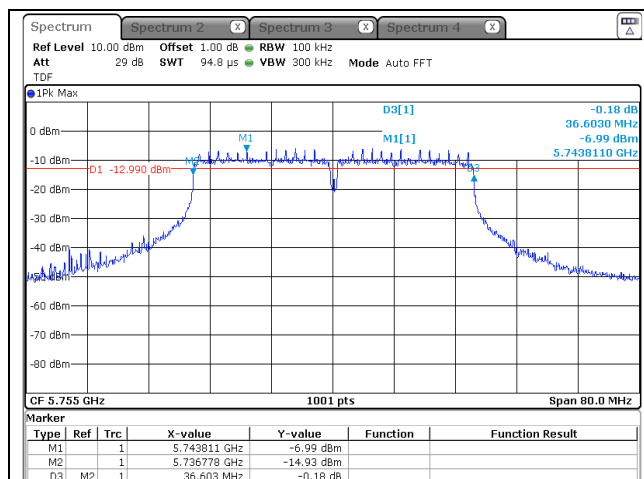
Report No.:
KR16-SRF0013
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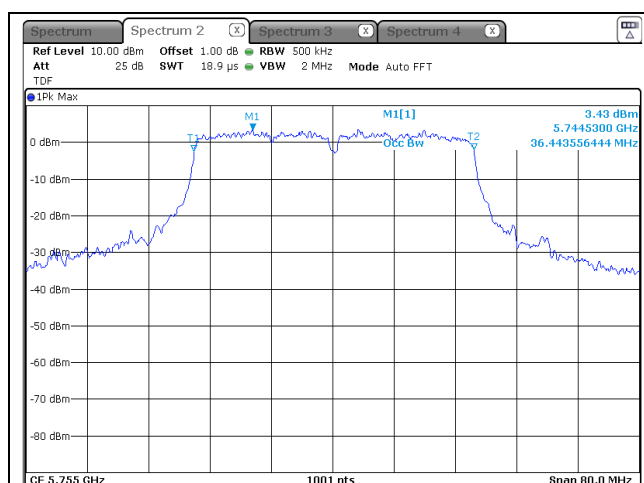
- 802.11ac VHT40_ MIMO (ANT 1+2+3)

- 5 755 MHz

EBW



OBW

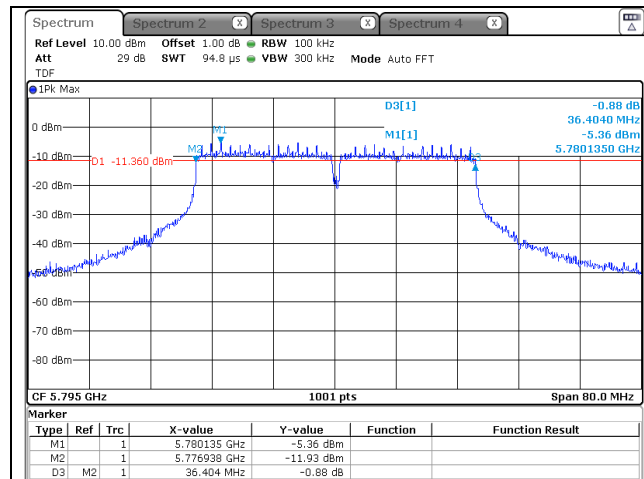


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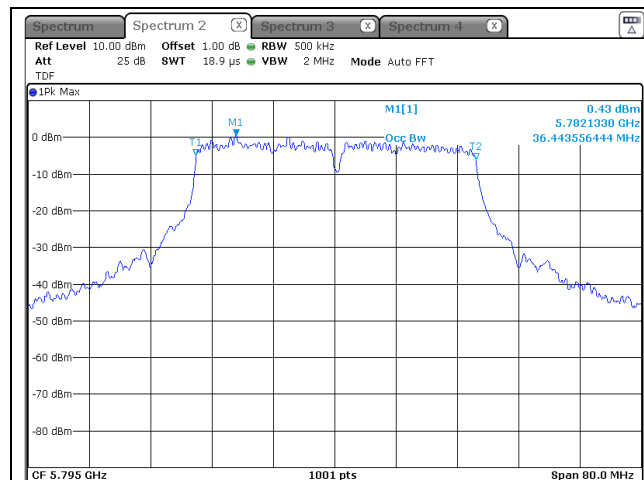
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- 5 795 MHz

EBW



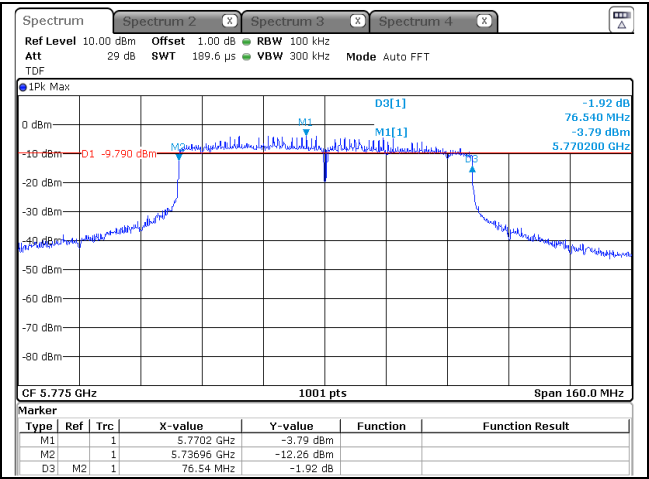
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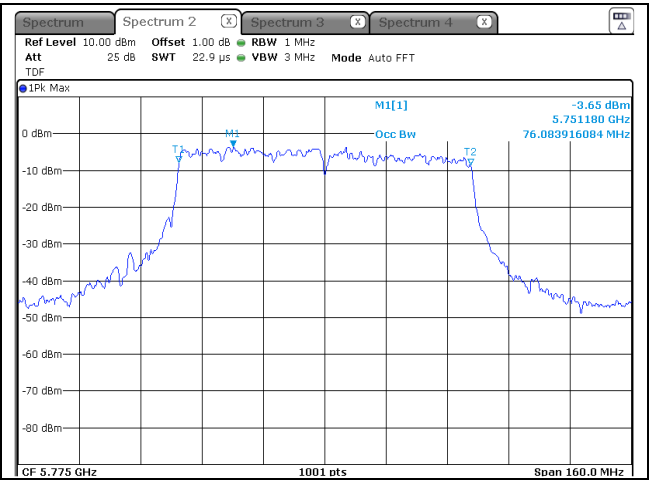
- 802.11ac VHT80_ MIMO (ANT 1+2+3)

- 5 775 MHz

EBW



OBW



5.4 Peak Power Spectral Density

5.4.1 Regulation

According to §15.407(a) (1) (ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a) (2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

According to §15.407(a) (3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information.

The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

5.4.2 Measurement Procedure

These test measurement settings are specified in section F of 789033 D02 General UNII Test Procedures New Rules v01.

5.4.2.1 Maximum power spectral density (PSD)

1. Create an average power spectrum for the EUT operating mode being tested by following the instructions in section II.E.2. for measuring maximum conducted output power using a spectrum analyzer or EMI receiver: select the appropriate test method (SA-1, SA-2, SA-3, or alternatives to each) and apply it up to, but not including, the step labeled, "Compute power...". (This procedure is required even if the maximum conducted output power measurement was performed using a power meter, method PM.)
2. Use the peak search function on the instrument to find the peak of the spectrum and record its value.
3. Make the following adjustments to the peak value of the spectrum, if applicable:
 - a) If Method SA-2 or SA-2 Alternative was used, add $10 \log(1/x)$, where x is the duty cycle, to the peak of the spectrum.
 - b) If Method SA-3 Alternative was used and the linear mode was used in step II.E.2.g)(viii), add 1 dB to the final result to compensate for the difference between linear averaging and power averaging.
4. The result is the Maximum PSD over 1 MHz reference bandwidth.
5. For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
 - a) Set $RBW \geq 1/T$, where T is defined in section II.B.1.a).
 - c) Set $VBW \geq 3$ RBW.
 - d) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10\log(500\text{kHz}/RBW)$ to the measured result, whereas $RBW (< 500 \text{ kHz})$ is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
 - e) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add $10\log(1\text{MHz}/RBW)$ to the measured result, whereas $RBW (< 1 \text{ MHz})$ is the reduced resolution bandwidth of spectrum analyzer set during measurement.
 - f) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the sections 5.c) and 5.d) above, since $RBW=100 \text{ kHz}$ is available on nearly all spectrum analyzers.

5.4.3 Test Result

-Complied

- 5 150 Band

- Ant 1

- 802.11a

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	4.18	4.18	17.00	12.82
5 200	4.03	4.03	17.00	12.97
5 240	3.96	3.96	17.00	13.04

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.39	3.39	17.00	13.61
5 200	3.30	3.30	17.00	13.70
5 240	3.14	3.14	17.00	13.86

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.29	3.29	17.00	13.71
5 200	3.11	3.11	17.00	13.89
5 240	3.12	3.12	17.00	13.88

- 802.11n HT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.68	0.10	-1.58	17.00	18.58
5 230	-1.21	0.10	-1.11	17.00	18.11

- 802.11ac VHT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.47	0.12	-1.35	17.00	18.35
5 230	-1.22	0.12	-1.10	17.00	18.10

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 210	-6.29	0.22	-6.07	17.00	23.07

- Ant 2**- 802.11a**

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.80	3.80	17.00	13.20
5 200	4.09	4.09	17.00	12.91
5 240	4.16	4.16	17.00	12.84

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.71	3.71	17.00	13.29
5 200	3.36	3.36	17.00	13.64
5 240	3.64	3.64	17.00	13.36

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.76	3.76	17.00	13.24
5 200	3.45	3.45	17.00	13.55
5 240	3.71	3.71	17.00	13.29

- 802.11n HT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.78	0.10	-1.68	17.00	18.68
5 230	-1.63	0.10	-1.53	17.00	18.53

- 802.11ac VHT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.56	0.12	-1.44	17.00	18.44
5 230	-1.42	0.12	-1.30	17.00	18.30

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 210	-6.27	0.22	-6.05	17.00	23.05

- Ant 3**- 802.11a**

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.43	3.43	17.00	13.57
5 200	3.98	3.98	17.00	13.02
5 240	3.83	3.83	17.00	13.17

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.23	3.23	17.00	13.77
5 200	3.48	3.48	17.00	13.52
5 240	3.46	3.46	17.00	13.54

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	3.57	3.57	17.00	13.43
5 200	3.54	3.54	17.00	13.46
5 240	3.33	3.33	17.00	13.67

- 802.11n HT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.88	0.10	-1.78	17.00	18.78
5 230	-2.09	0.10	-1.99	17.00	18.99

- 802.11ac VHT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-1.55	0.12	-1.43	17.00	18.43
5 230	-1.87	0.12	-1.75	17.00	18.75

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 210	-6.63	0.22	-6.41	17.00	23.41

- MIMO (ANT 1+2)

- 802.11n HT20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	0.65	0.74	0.11	3.81	16.87	13.06
5 200	0.59	0.73	0.11	3.78	16.87	13.09
5 240	0.46	0.64	0.11	3.67	16.87	13.20

- 802.11ac VHT20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	0.53	0.67	0.09	3.70	16.87	13.17
5 200	0.29	0.71	0.09	3.61	16.87	13.26
5 240	0.52	0.84	0.09	3.79	16.87	13.08

- 802.11n HT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-4.98	-4.73	0.71	-1.14	16.87	18.01
5 230	-4.84	-4.61	0.71	-1.01	16.87	17.88

- 802.11ac VHT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-4.78	-4.38	0.71	-0.85	16.87	17.72
5 230	-4.68	-4.67	0.71	-0.95	16.87	17.82

- 802.11ac VHT80

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 210	-9.31	-9.68	0.48	-6.00	16.87	22.87

- MIMO (ANT 1+2+3)

- 802.11n HT20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	-1.48	-1.03	-1.35	0.14	3.63	15.11	11.48
5 200	-1.70	-0.64	-1.14	0.14	3.77	15.11	11.33
5 240	-1.69	-1.25	-0.69	0.14	3.72	15.11	11.39

- 802.11ac VHT20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 180	-0.87	-0.75	-0.88	0.14	4.08	15.11	11.03
5 200	-0.84	-1.20	-0.70	0.14	4.00	15.11	11.10
5 240	-1.03	-0.75	-0.31	0.14	4.23	15.11	10.88

- 802.11n HT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-6.67	-5.79	-6.15	0.29	-1.12	15.11	16.23
5 230	-6.03	-6.67	-5.78	0.29	-1.08	15.11	16.19

- 802.11ac VHT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 190	-6.19	-6.45	-6.25	0.31	-1.22	15.11	16.33
5 230	-6.16	-6.18	-5.72	0.31	-0.94	15.11	16.05

- 802.11ac VHT80

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 210	-10.53	-10.83	-11.10	0.66	-5.39	15.11	20.50

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**- 5 725 Band****- Ant 1****- 802.11a**

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	1.23	1.23	30.00	28.77
5 785	1.16	1.16	30.00	28.84
5 825	1.01	1.01	30.00	28.99

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.10	-0.10	30.00	30.10
5 785	-0.43	-0.43	30.00	30.43
5 825	-0.48	-0.48	30.00	30.48

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.27	-0.27	30.00	30.27
5 785	-0.31	-0.31	30.00	30.31
5 825	-0.51	-0.51	30.00	30.51

- 802.11n HT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.65	0.12	-4.53	30.00	34.53
5 795	-4.93	0.12	-4.81	30.00	34.81

- 802.11ac VHT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.54	0.12	-4.42	30.00	34.42
5 795	-4.63	0.12	-4.51	30.00	34.51

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 775	-8.49	0.28	-8.21	30.00	38.21

- Ant 2**- 802.11a**

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	1.13	1.13	30.00	28.87
5 785	1.09	1.09	30.00	28.91
5 825	0.98	0.98	30.00	29.02

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.21	-0.21	30.00	30.21
5 785	-0.41	-0.41	30.00	30.41
5 825	-0.57	-0.57	30.00	30.57

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.12	-0.12	30.00	30.12
5 785	-0.43	-0.43	30.00	30.43
5 825	-0.40	-0.40	30.00	30.40

- 802.11n HT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.37	0.12	-4.25	30.00	34.25
5 795	-4.73	0.12	-4.61	30.00	34.61

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**- 802.11ac VHT40**

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.44	0.12	-4.32	30.00	34.32
5 795	-4.42	0.12	-4.30	30.00	34.30

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 775	-8.70	0.28	-8.42	30.00	38.42

- Ant 3**- 802.11a**

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	1.18	1.18	30.00	28.82
5 785	0.98	0.98	30.00	29.02
5 825	1.16	1.16	30.00	28.84

- 802.11n HT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.17	-0.17	30.00	30.17
5 785	-0.43	-0.43	30.00	30.43
5 825	-0.59	-0.59	30.00	30.59

- 802.11ac VHT20

Frequency [MHz]	Result [dBm/MHz]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-0.14	-0.14	30.00	30.14
5 785	-0.48	-0.48	30.00	30.48
5 825	-0.67	-0.67	30.00	30.67

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**- 802.11n HT40**

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.36	0.12	-4.24	30.00	34.24
5 795	-4.85	0.12	-4.73	30.00	34.73

- 802.11ac VHT40

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-4.01	0.12	-3.89	30.00	33.89
5 795	-4.56	0.12	-4.44	30.00	34.44

- 802.11ac VHT80

Frequency [MHz]	Result [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 775	-8.85	0.28	-8.57	30.00	38.57

- MIMO (ANT 1+2)**- 802.11n HT20**

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-2.89	-3.00	0.14	0.21	27.35	27.14
5 785	-3.07	-2.88	0.14	0.18	27.35	27.17
5 825	-3.59	-3.45	0.14	-0.37	27.35	27.72

- 802.11ac VTH20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-2.87	-3.14	13.82	13.83	27.35	13.52
5 785	-3.34	-2.93	13.64	13.52	27.35	13.83
5 825	-3.52	-3.11	13.20	12.90	27.35	14.45

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**- 802.11n HT40**

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-8.43	-8.35	0.23	-5.15	27.35	32.50
5 795	-8.12	-8.07	0.23	-4.86	27.35	32.21

- 802.11ac VHT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-8.64	-8.15	0.23	-5.15	27.35	32.50
5 795	-8.26	-8.28	0.23	-5.03	27.35	32.38

- 802.11ac VHT80

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 775	-8.23	-8.56	0.46	-4.92	27.35	32.27

- MIMO (ANT 1+2+3)**- 802.11n HT20**

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-4.71	-4.42	-3.93	0.17	0.60	25.59	24.99
5 785	-5.37	-4.33	-4.33	0.17	0.29	25.59	25.30
5 825	-5.10	-4.90	-4.46	0.17	0.13	25.59	25.46

- 802.11ac VTH20

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 745	-5.13	-4.15	-4.11	0.17	0.50	25.59	25.09
5 785	-5.31	-4.92	-4.26	0.17	0.13	25.59	25.46
5 825	-5.58	-4.95	-4.19	0.17	0.07	25.59	25.52

- 802.11n HT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-10.10	-9.90	-9.04	0.32	-4.56	25.59	30.15
5 795	-10.07	-9.86	-9.32	0.32	-4.64	25.59	30.23

- 802.11ac VHT40

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 755	-10.02	-9.94	-8.85	0.34	-4.46	25.59	30.05
5 795	-10.10	-9.42	-8.93	0.34	-4.35	25.59	29.94

- 802.11ac VHT80

Frequency [MHz]	Result_ ANT 1 [dBm/MHz]	Result_ ANT 2 [dBm/MHz]	Result_ ANT 3 [dBm/MHz]	D.C.C.F [dB]	Total result [dBm/MHz]	Limit [dBm]	Margin [dB]
5 775	-14.16	-13.86	-12.96	0.65	-8.21	25.59	33.80

Note:

1. D.C.C.F = Duty cycle correction factor

5.4.4 Test Plot

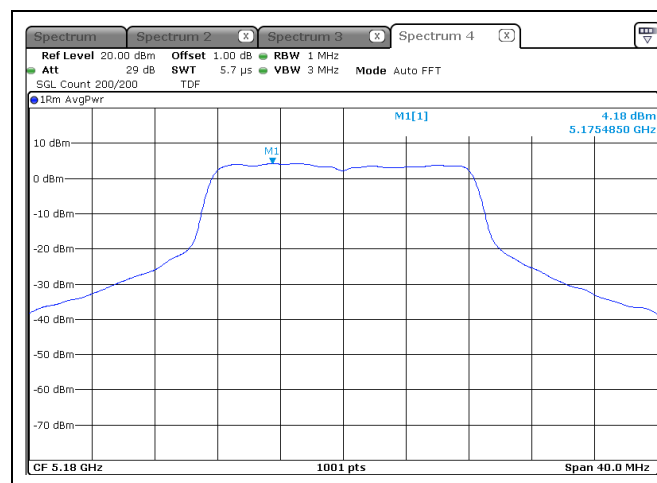
Figure 2. Plot of the Power Spectral Density

- 5 150 Band

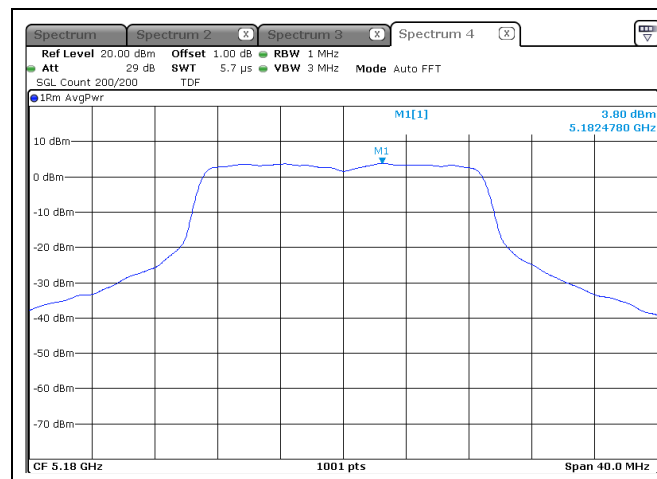
- 802.11a

- 5 180 MHz

ANT 1



ANT 2



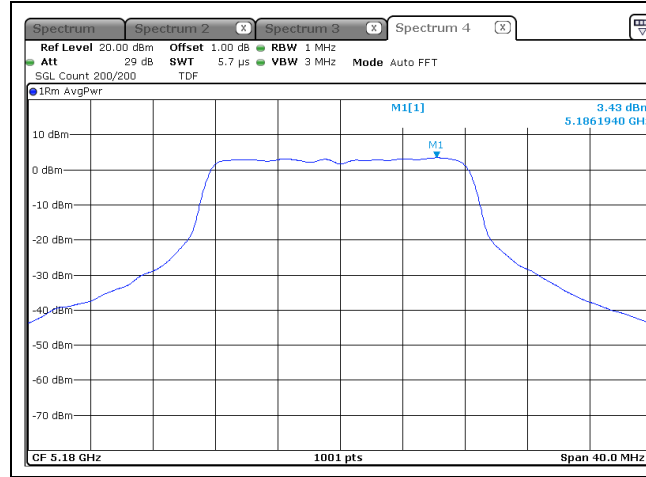
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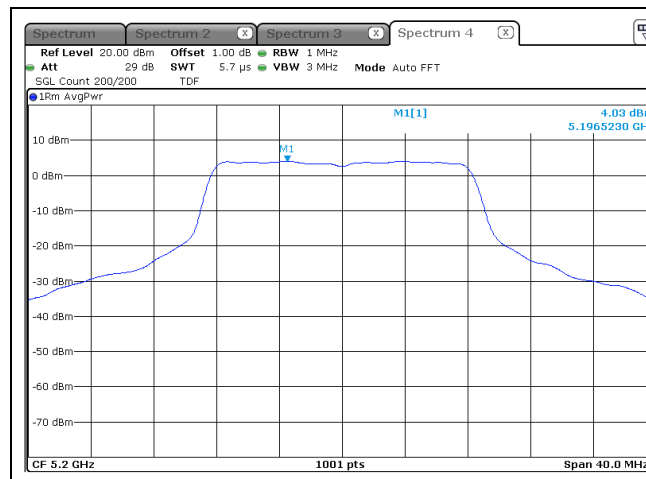


ANT 3

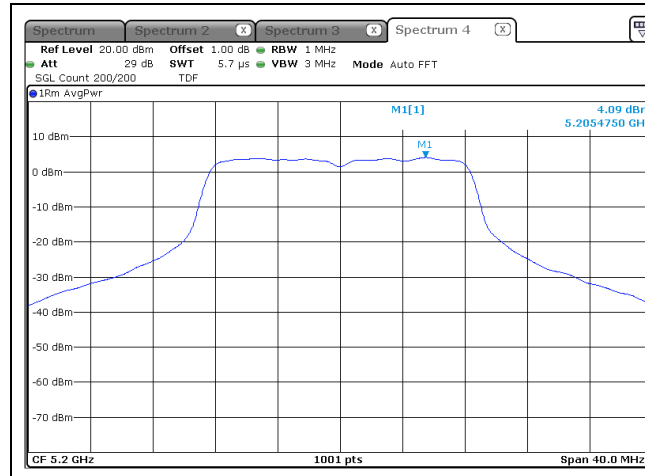


- 5 200 MHz

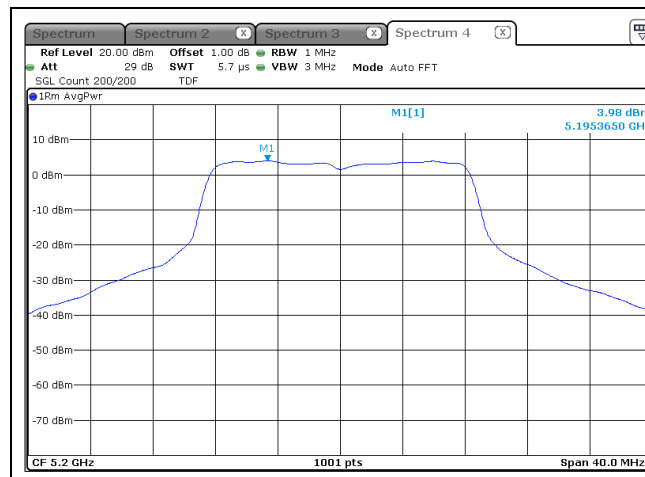
ANT 1



ANT 2



ANT 3



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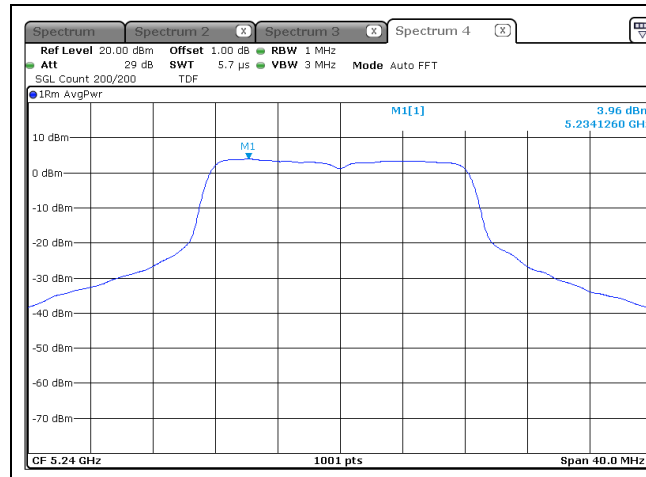
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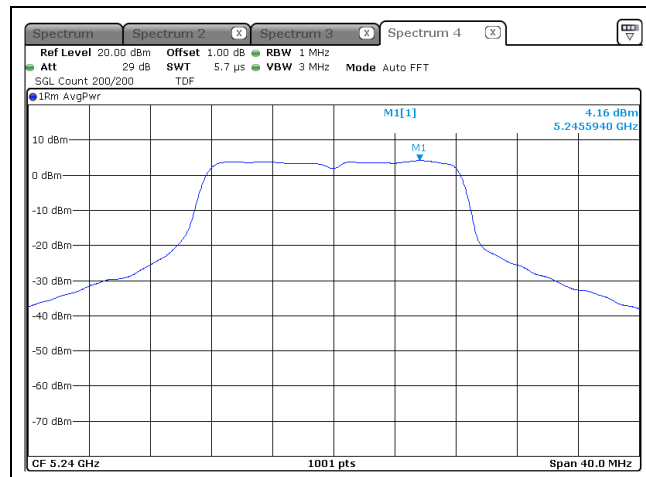


- 5 240 MHz

ANT 1



ANT 2



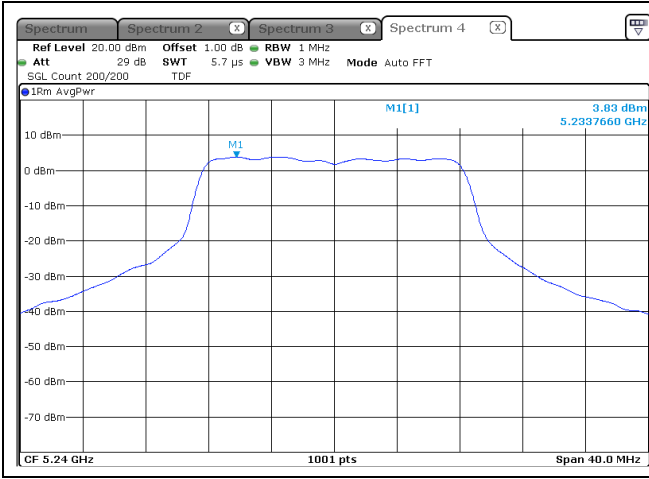
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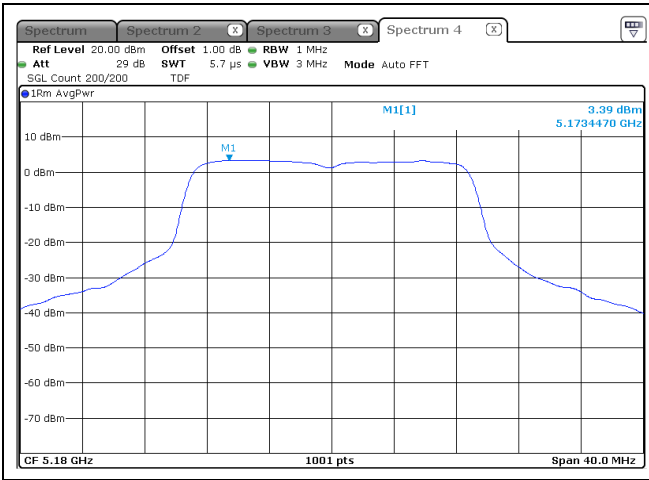
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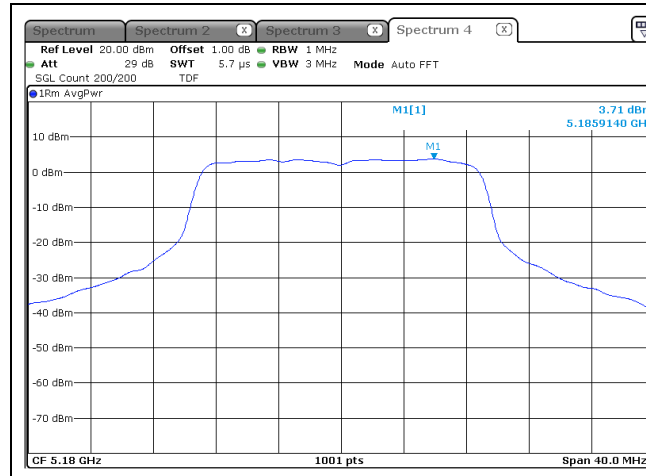
- 802.11n HT20

- 5 180 MHz

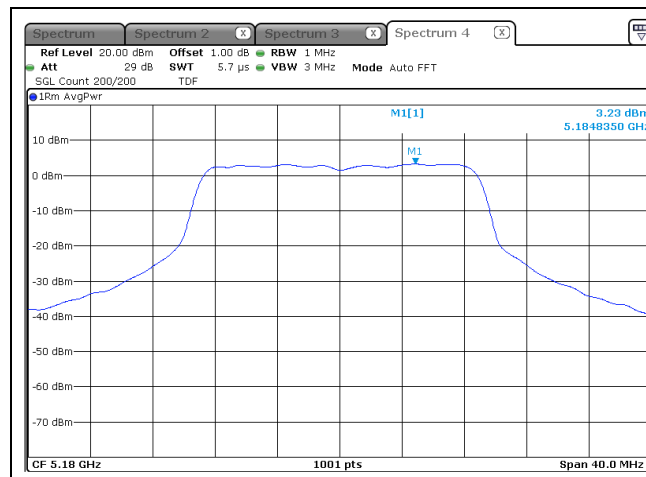
ANT 1



ANT 2



ANT 3



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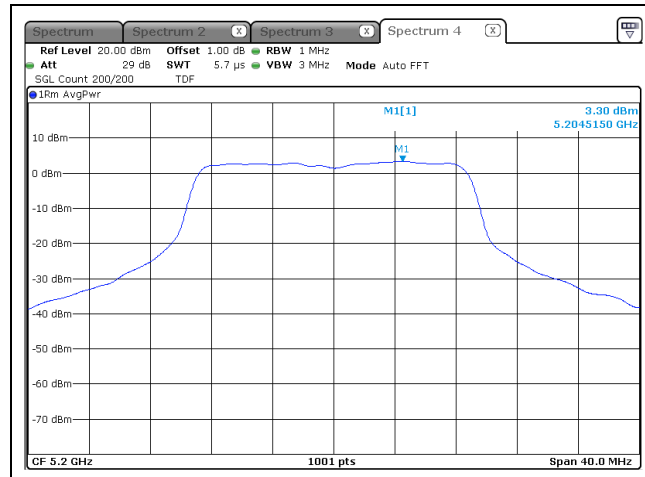
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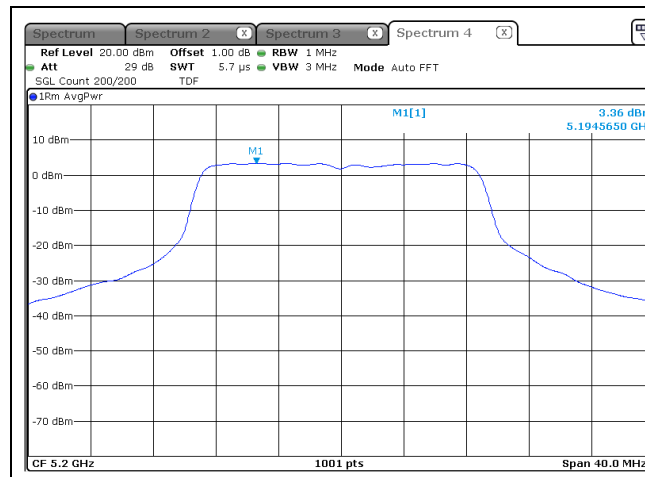


- 5 200 MHz

ANT 1



ANT 2



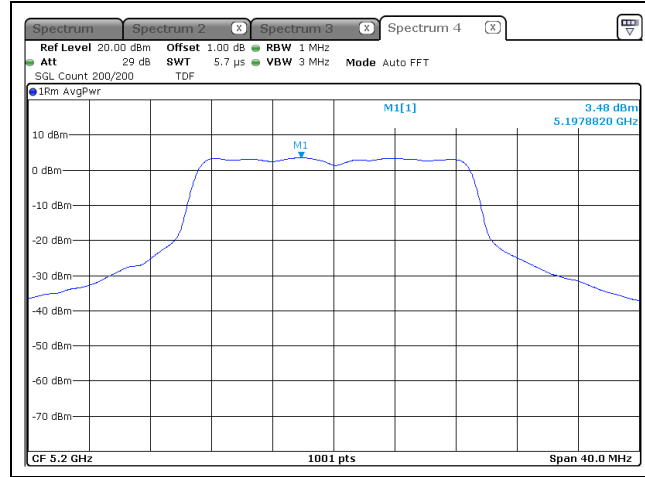
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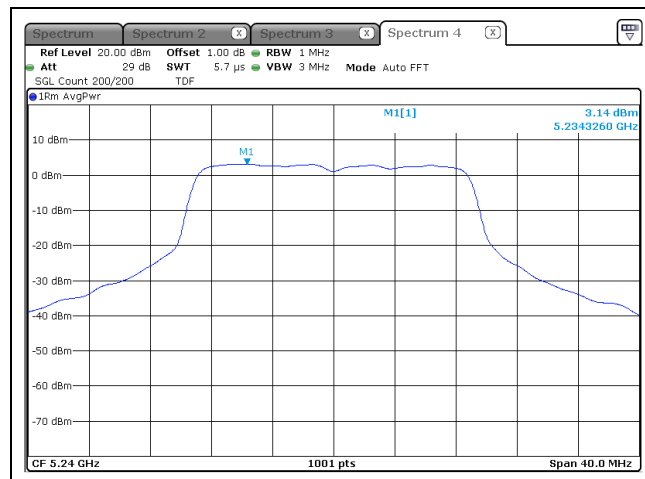


ANT 3



- 5 240 MHz

ANT 1



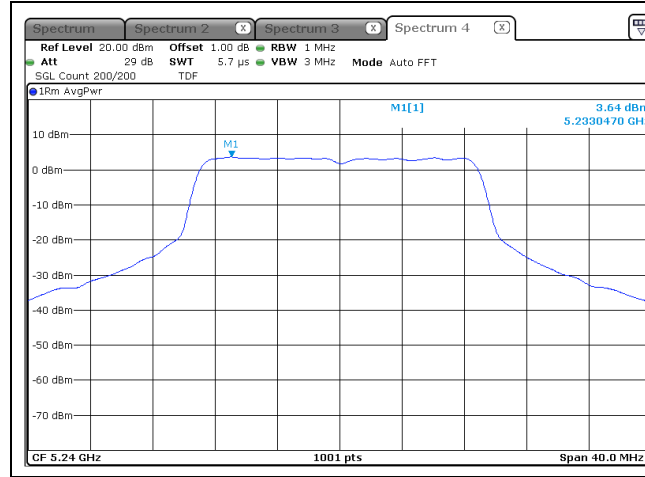
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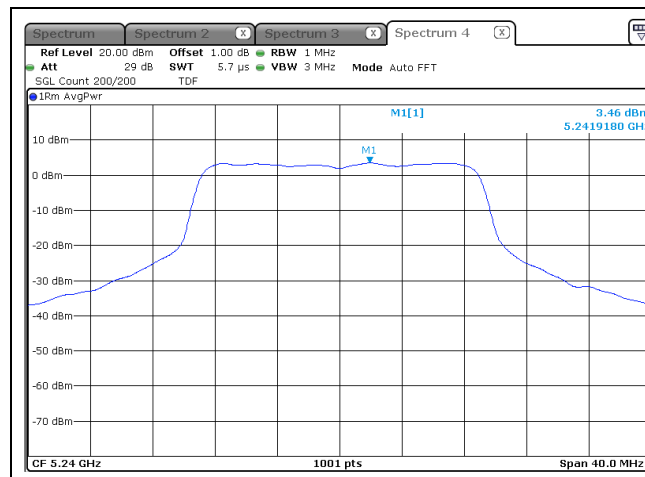
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ANT 2



ANT 3



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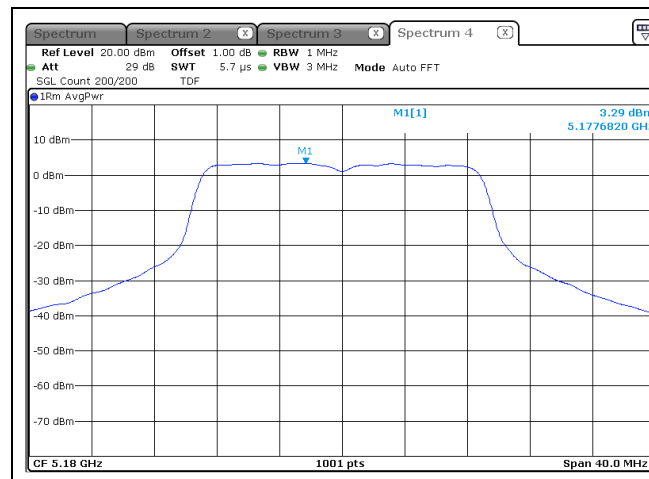
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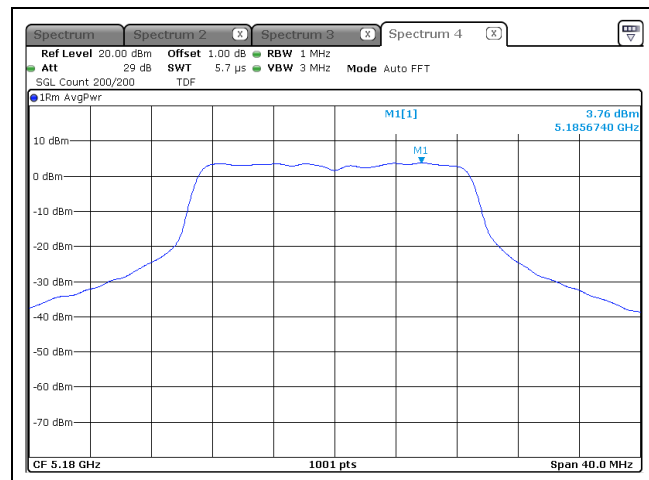
- 802.11ac VHT20

- 5 180 MHz

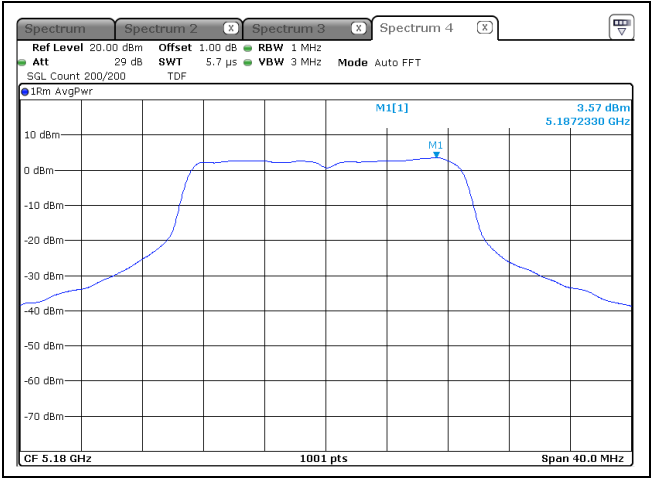
ANT 1



ANT 2

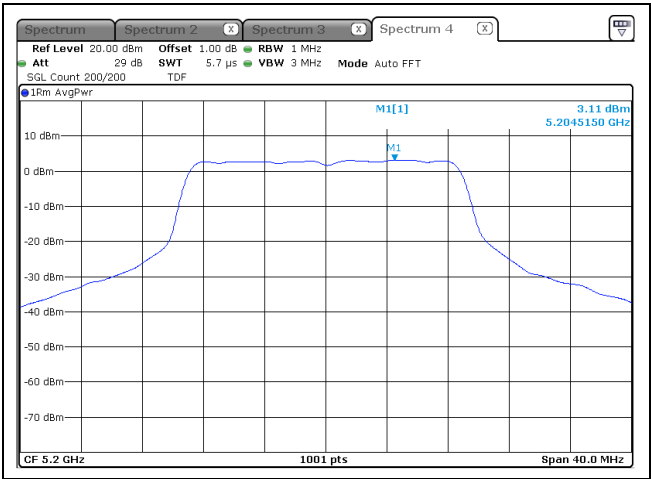


ANT 3



- 5 200 MHz

ANT 1



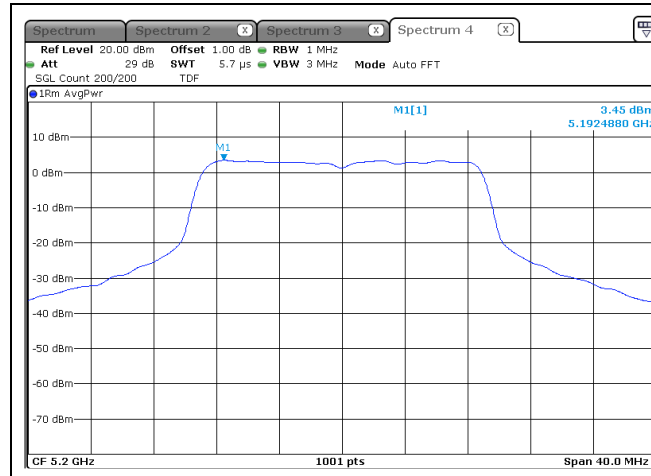
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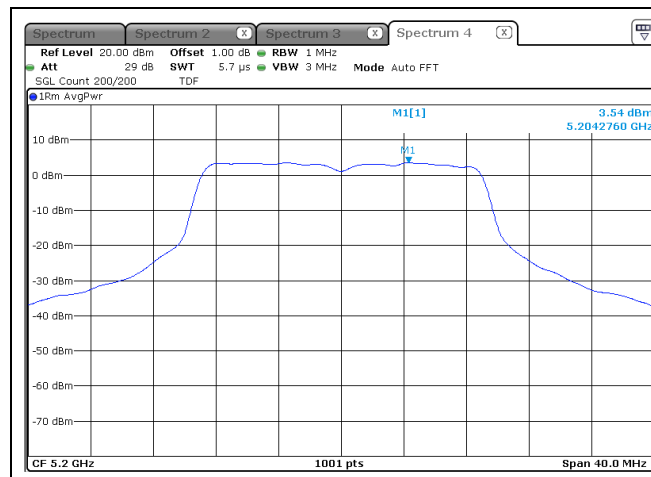
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ANT 2

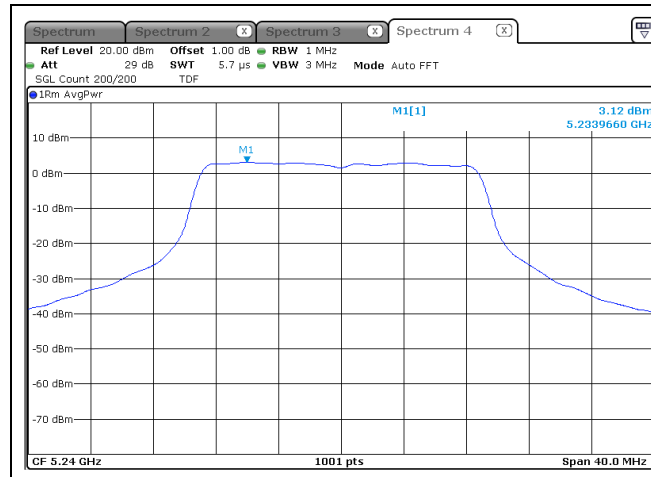


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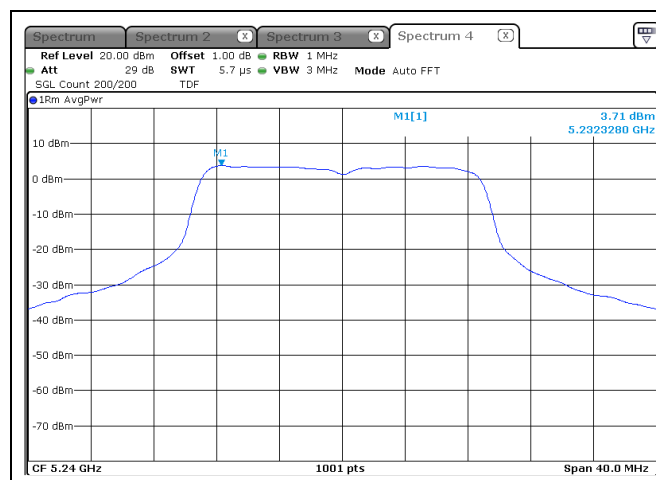


- 5 240 MHz

ANT 1



ANT 2



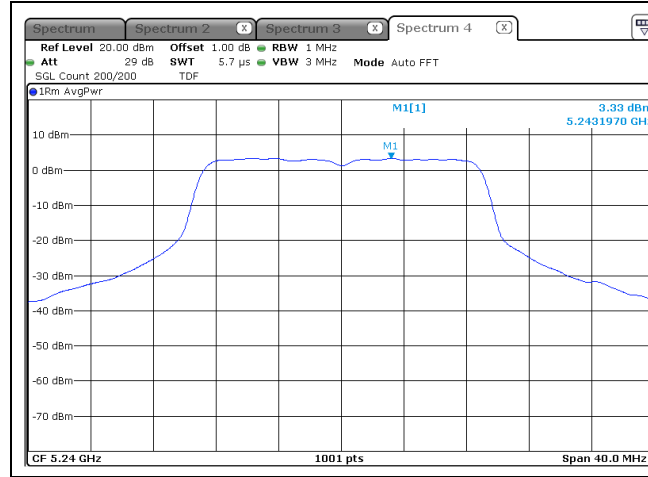
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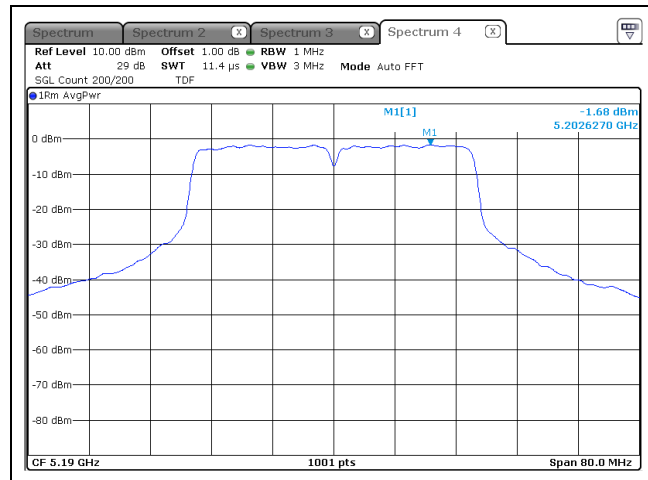
ANT 3



- 802.11n HT40

- 5 190 MHz

ANT 1



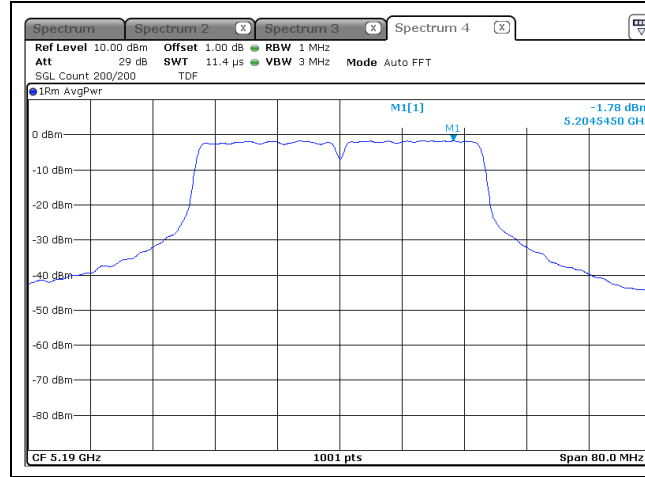
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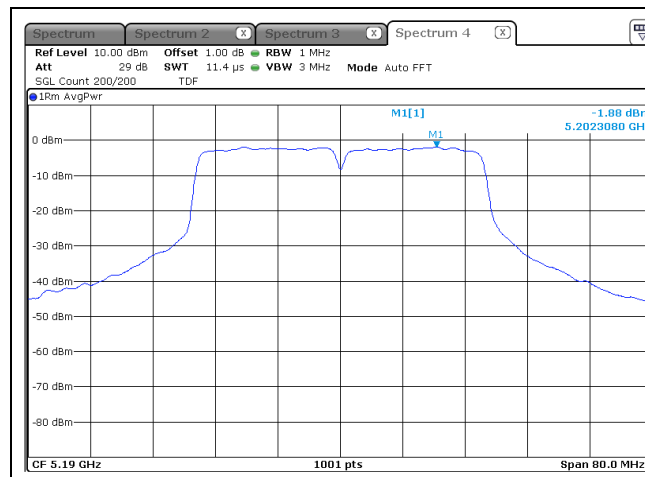
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ANT 2



ANT 3



KCTL Inc.

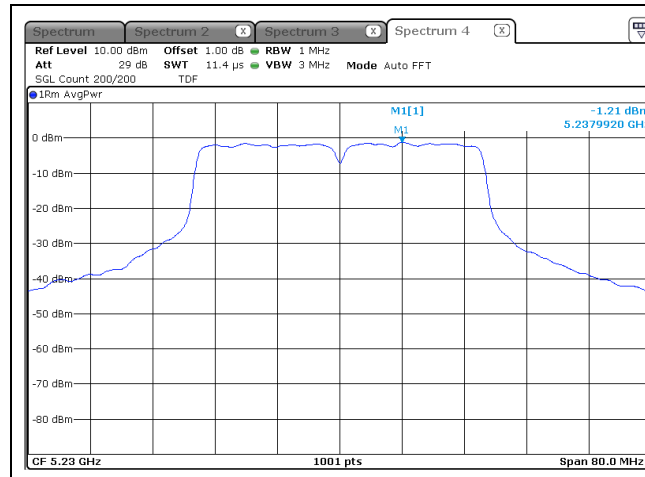
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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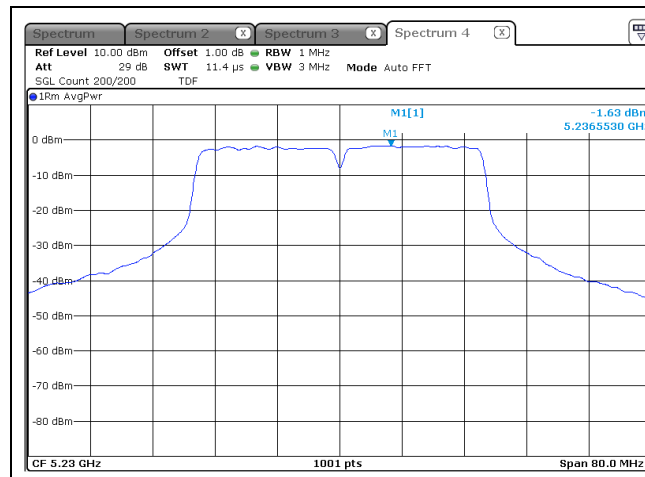


- 5 230 MHz

ANT 1



ANT 2



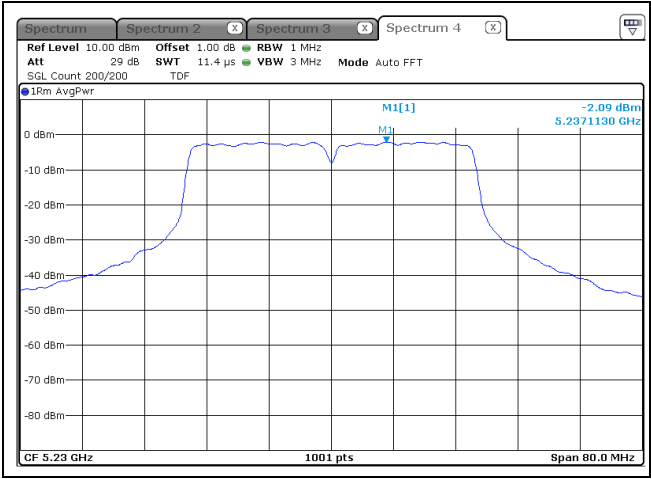
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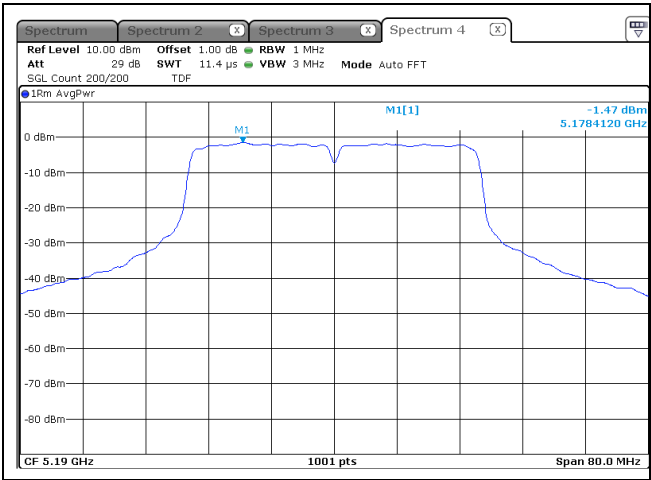
ANT 3



- 802.11ac VHT40

- 5 190 MHz

ANT 1



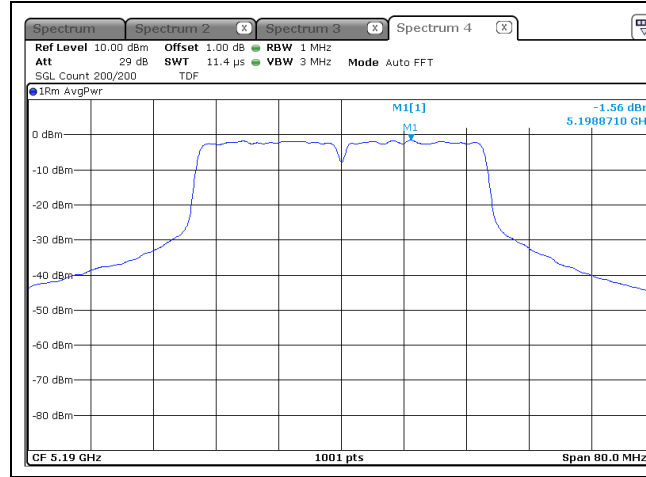
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Suwon-si, Gyeonggi-do, 443-390, Korea
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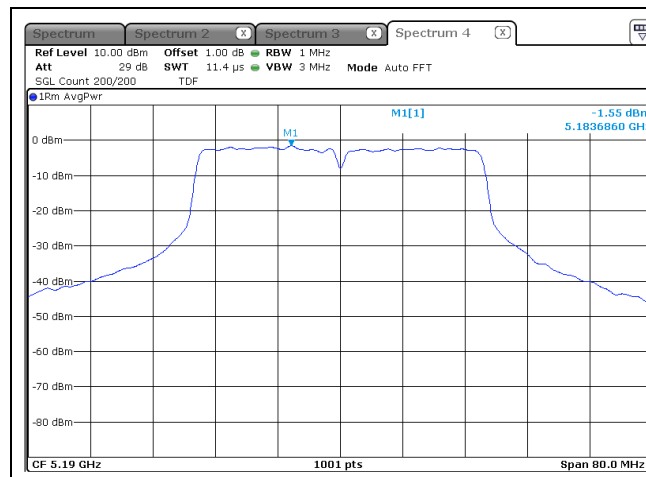
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ANT 2



ANT 3



KCTL Inc.

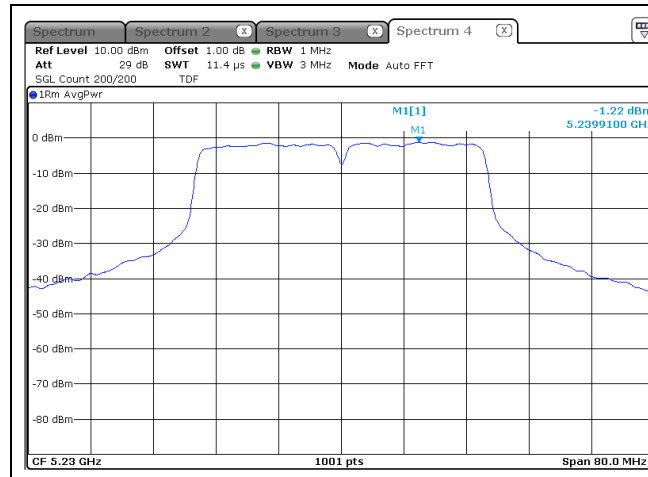
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 443-390, Korea
TEL: 82-70-5008-1021 FAX: 82-505-299-8311
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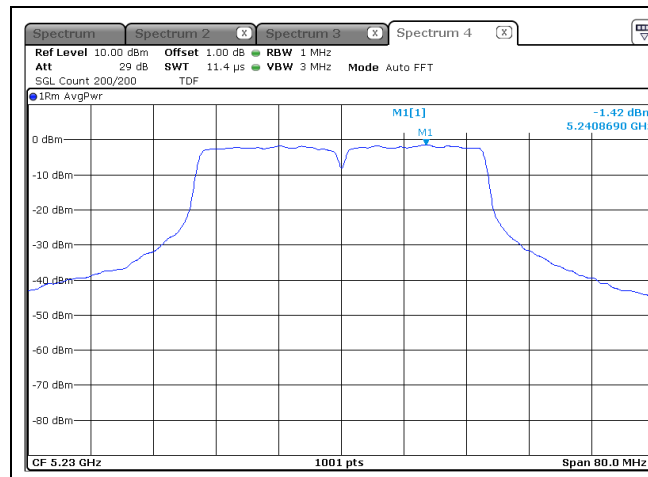


- 5 230 MHz

ANT 1



ANT 2



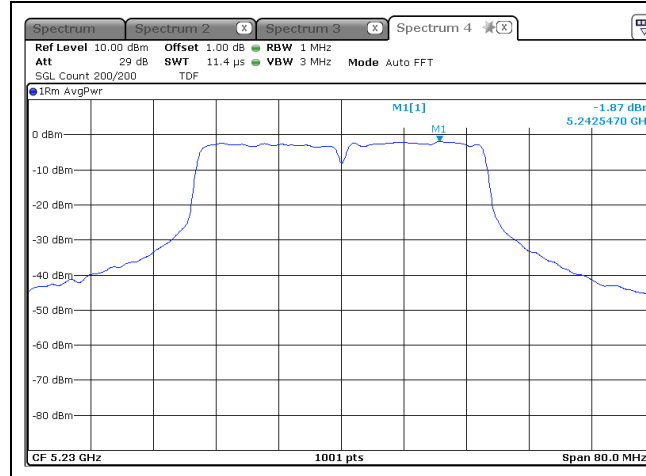
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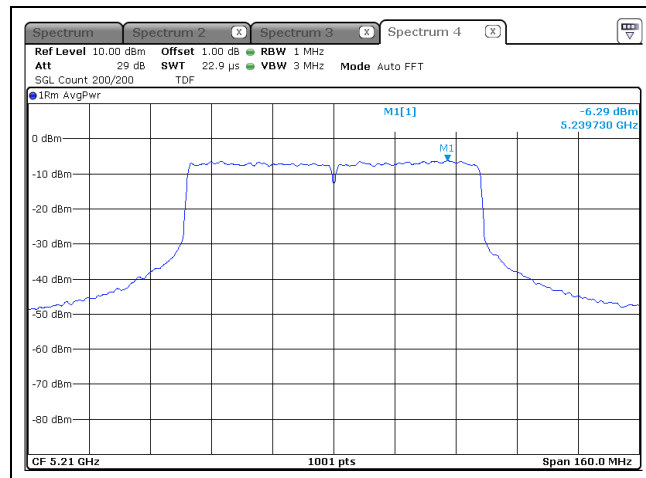
ANT 3



- 802.11ac VHT80

- 5 210 MHz

ANT 1



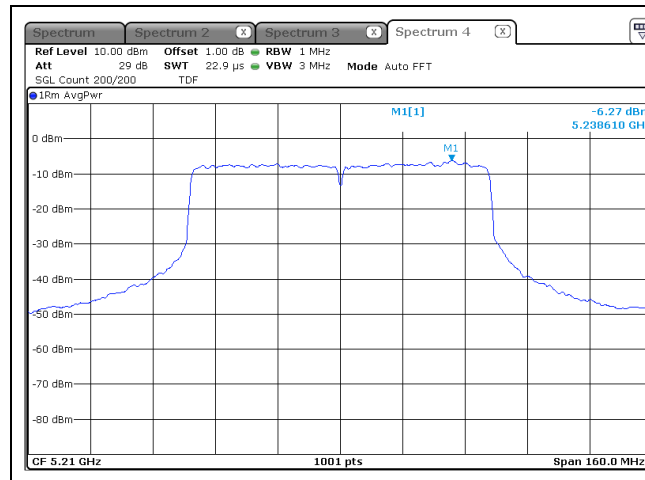
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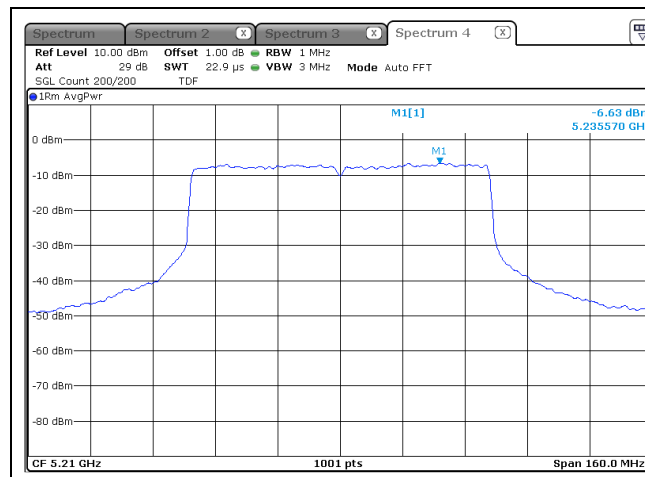
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ANT 2



ANT 3



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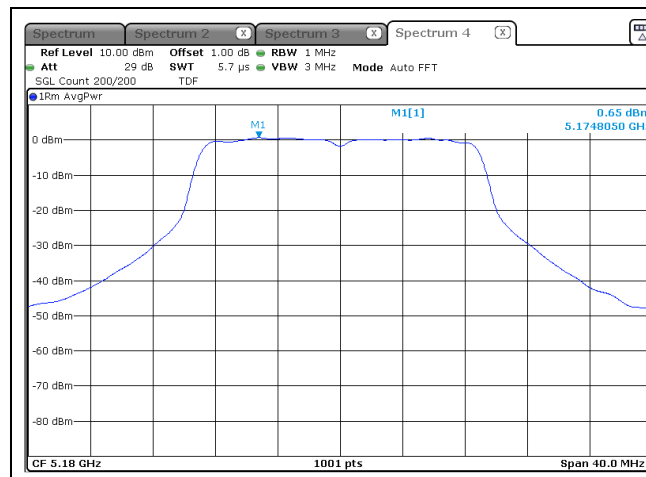
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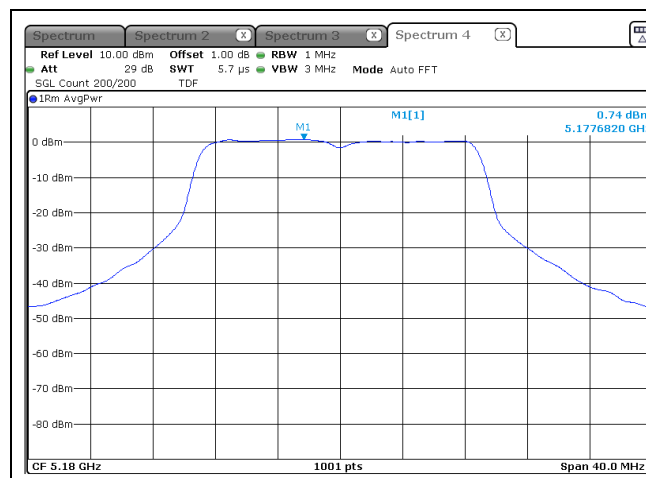
- 802.11n HT20

- 5 180 MHz

MIMO 2Tx (ANT 1)

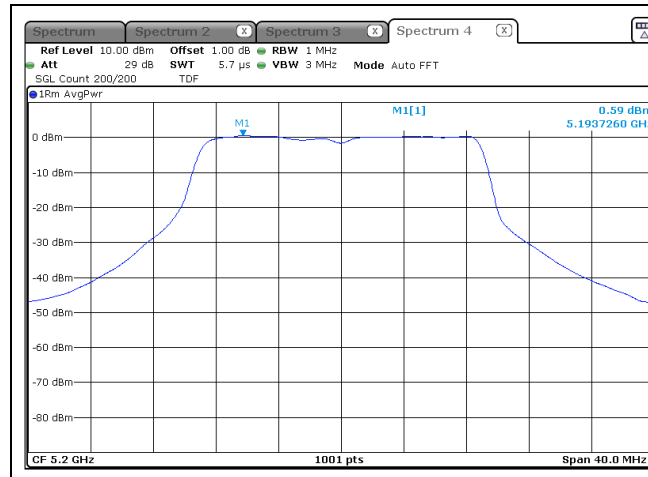


MIMO 2Tx (ANT 2)

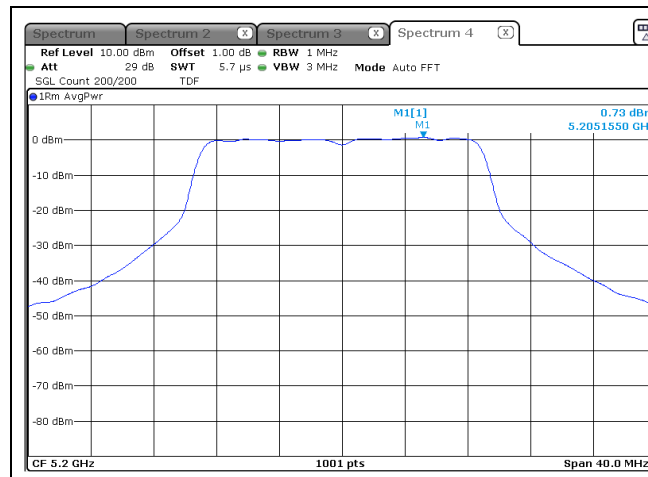


- 5 200 MHz

MIMO 2Tx (ANT 1)

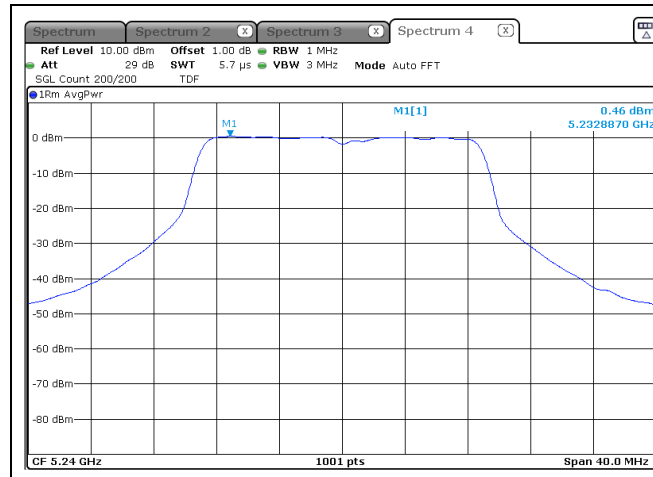


MIMO 2Tx (ANT 2)

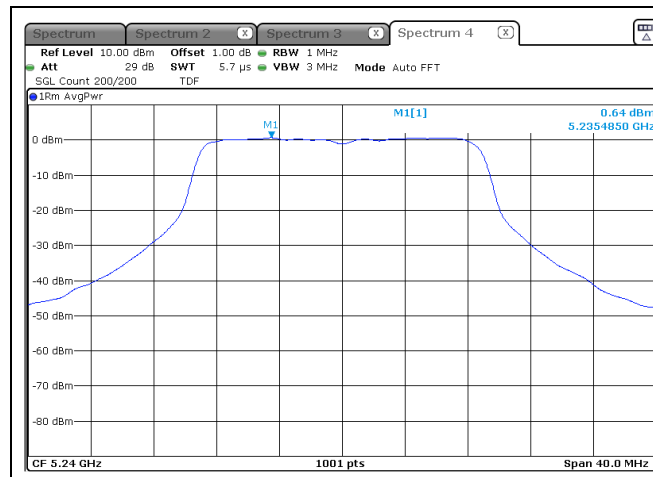


- 5 240 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



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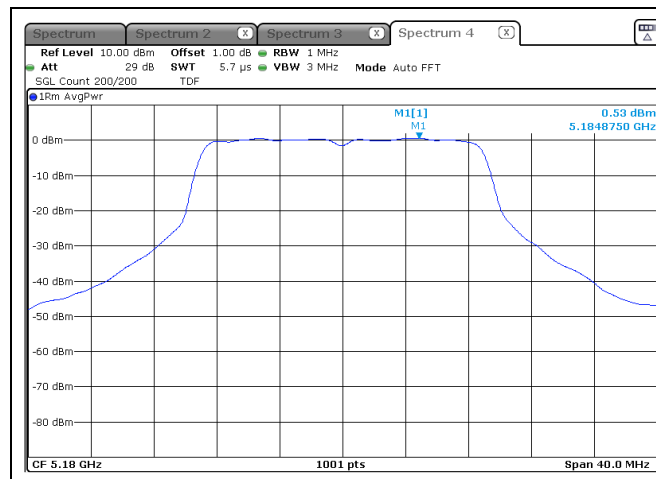
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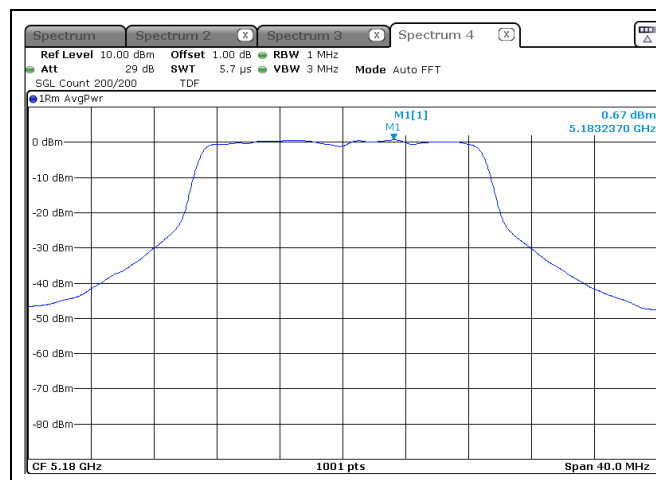
- 802.11ac VHT20

- 5 180 MHz

MIMO 2Tx (ANT 1)

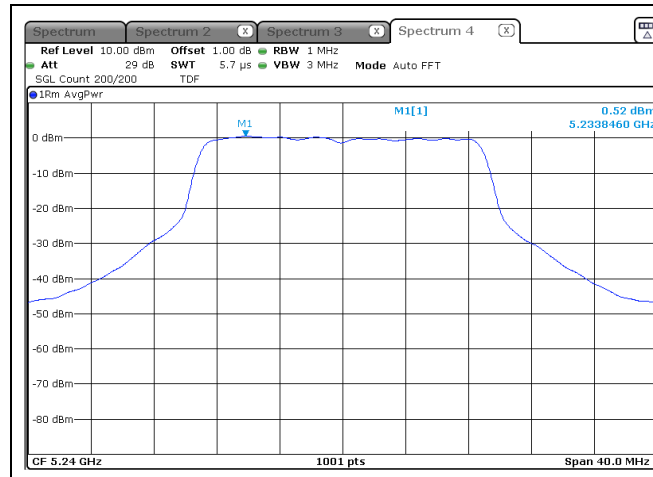


MIMO 2Tx (ANT 2)

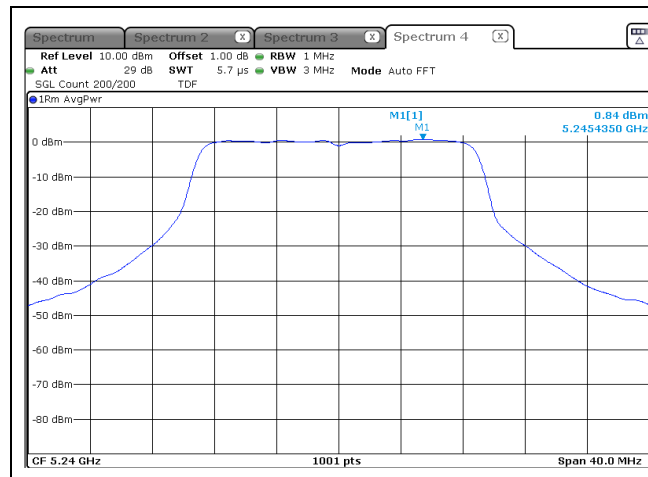


- 5 240 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



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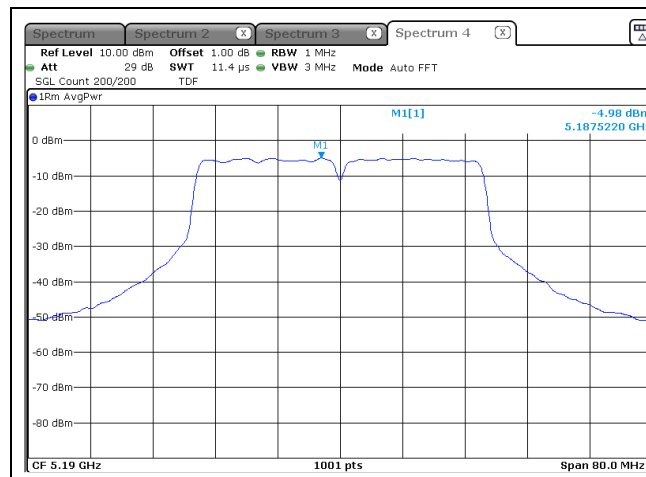
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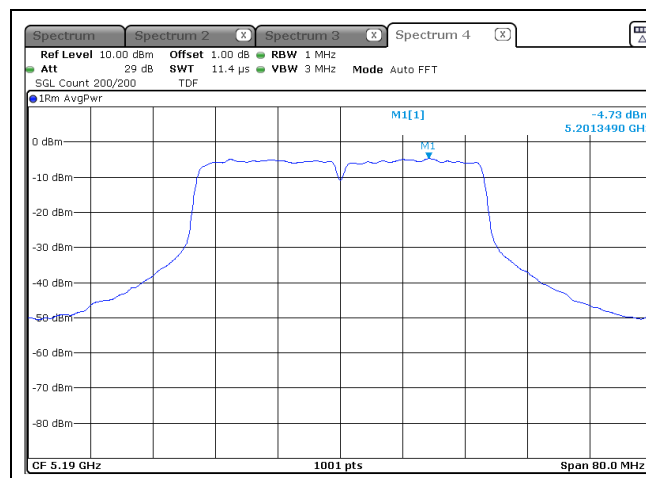
- 802.11n HT40

- 5 190 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



KCTL Inc.

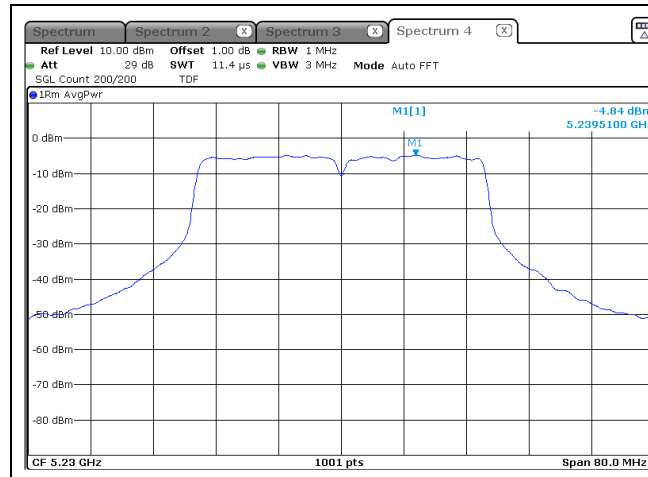
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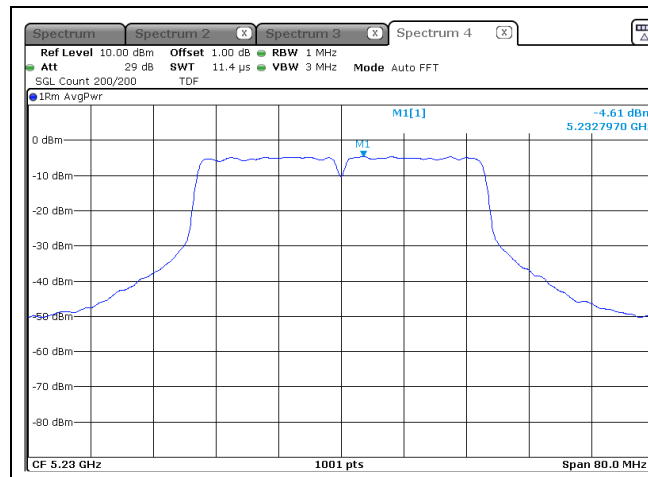


- 5 230 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



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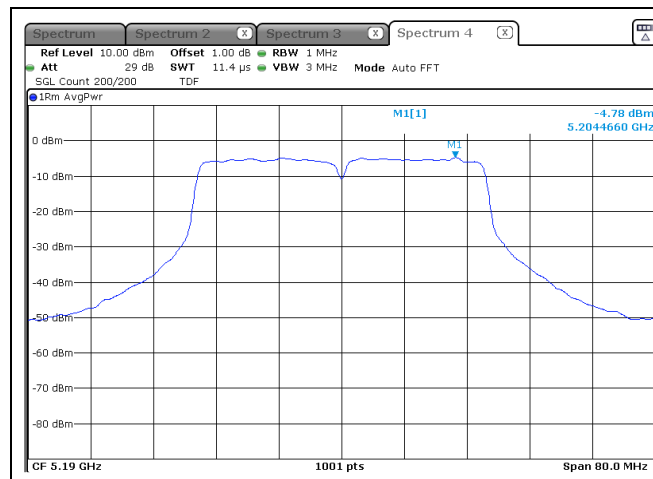
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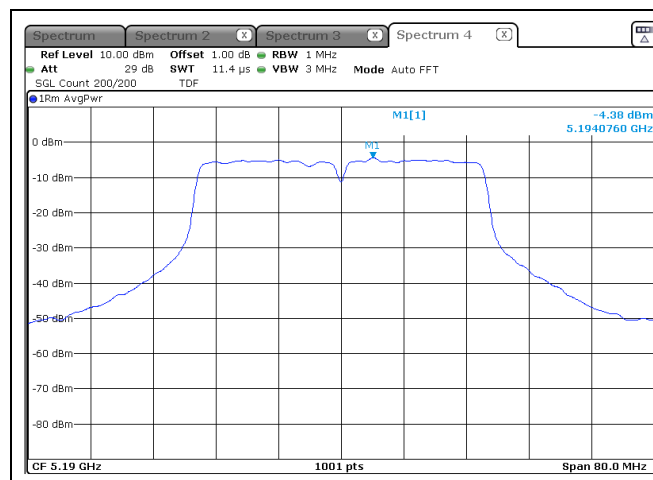
- 802.11ac VHT40

- 5 190 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



KCTL Inc.

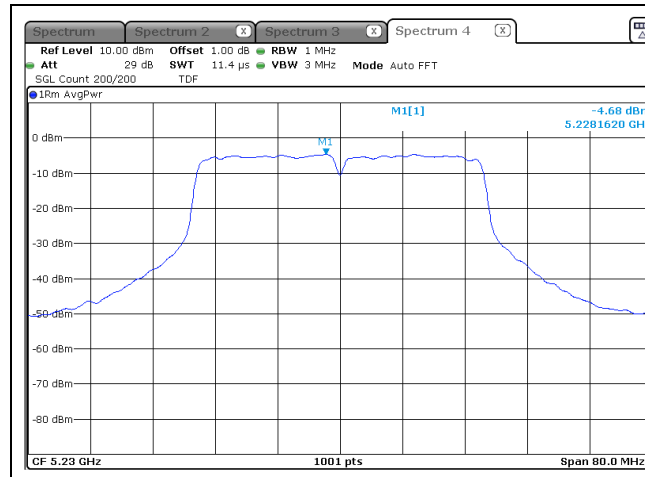
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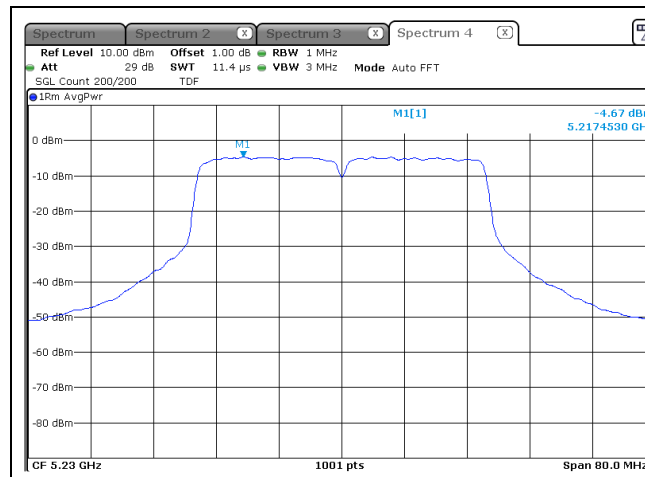


- 5 230 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



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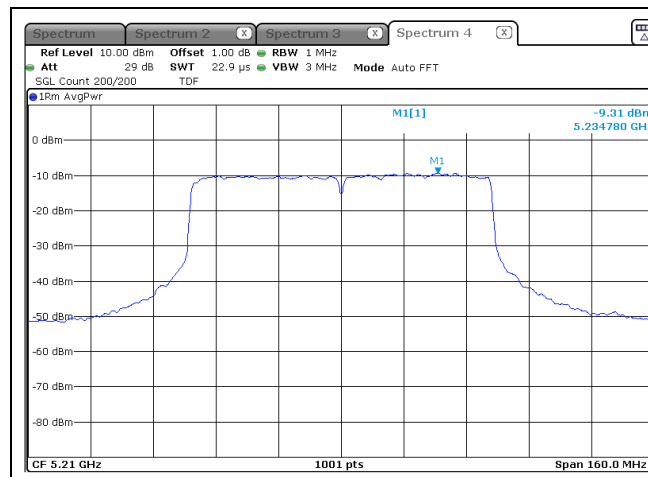
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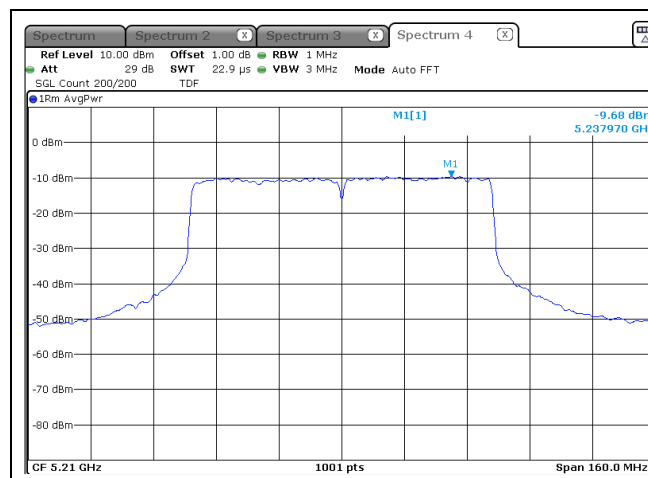
- 802.11ac VHT80

- 5 210 MHz

MIMO 2Tx (ANT 1)



MIMO 2Tx (ANT 2)



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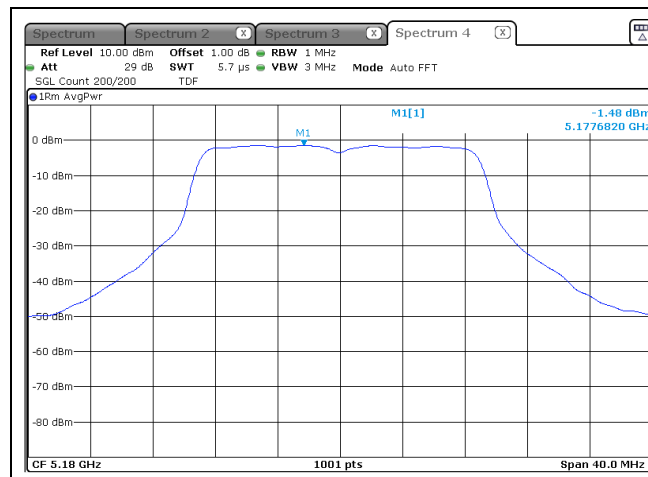
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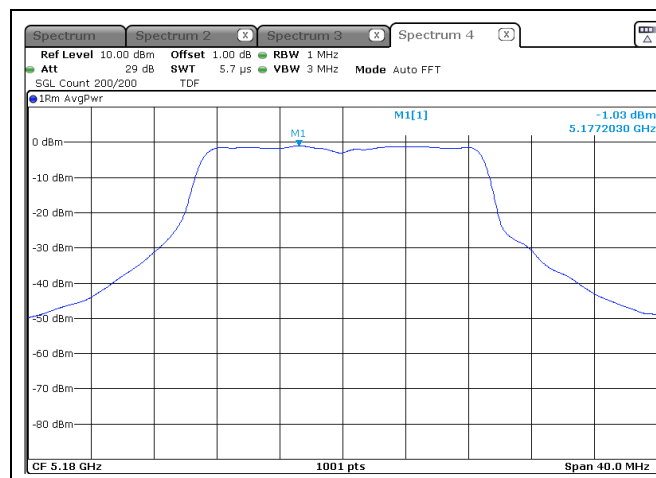
- 802.11n HT20

- 5 180 MHz

MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



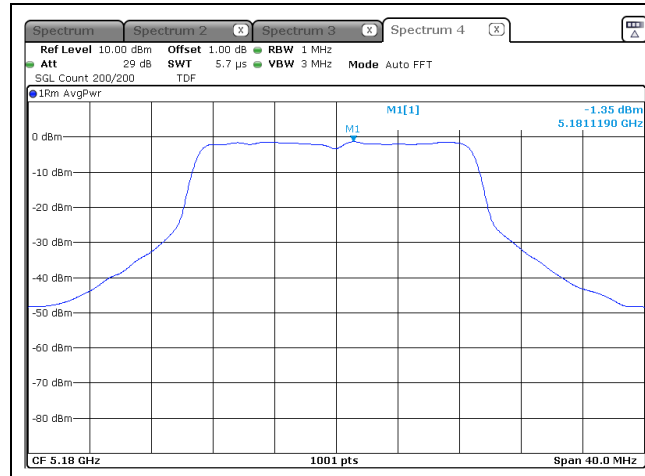
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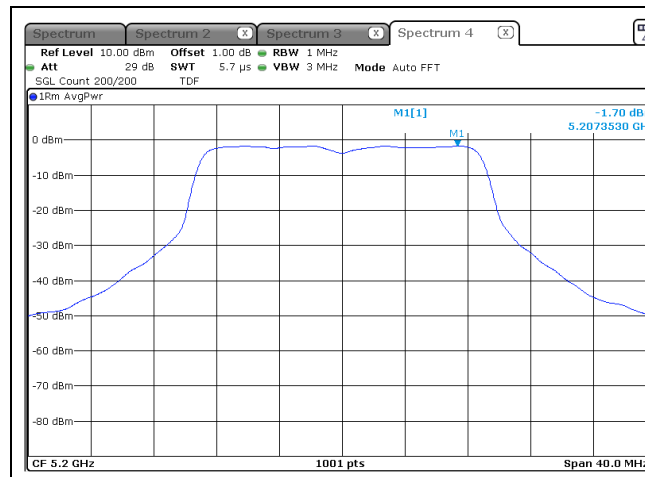


MIMO 3Tx (ANT 3)

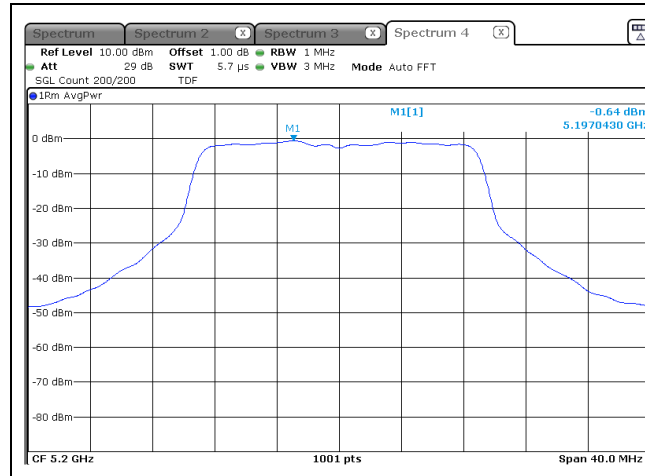


- 5 200 MHz

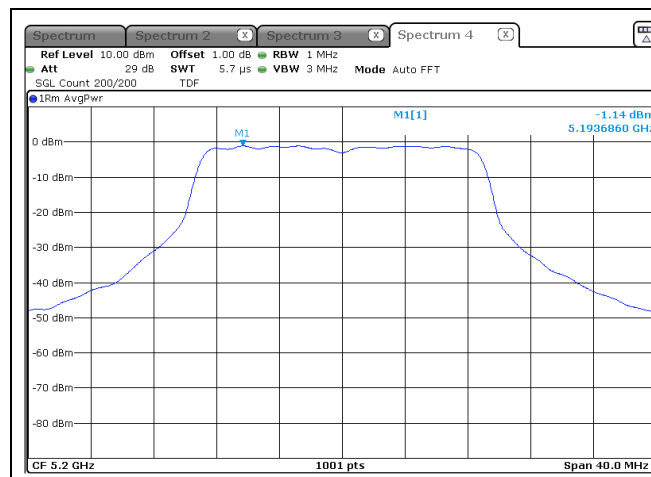
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)

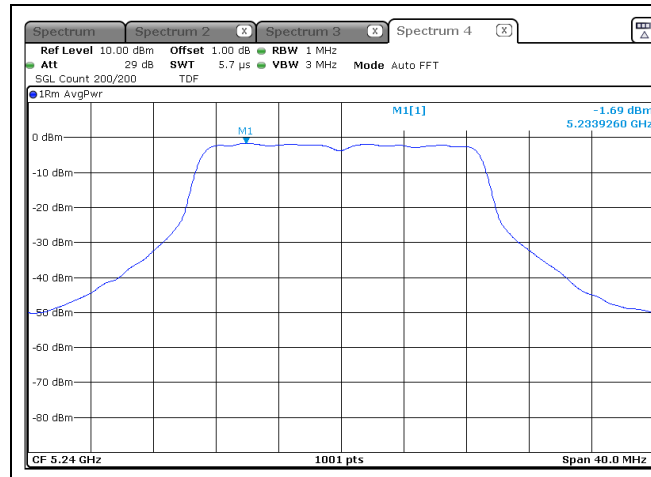


MIMO 3Tx (ANT 3)

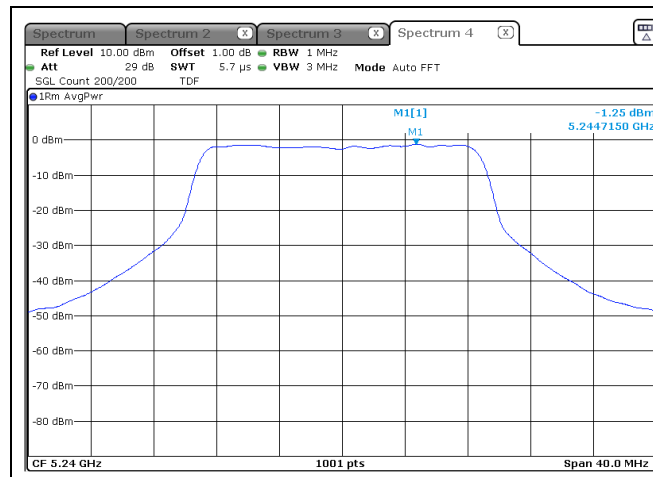


- 5 240 MHz

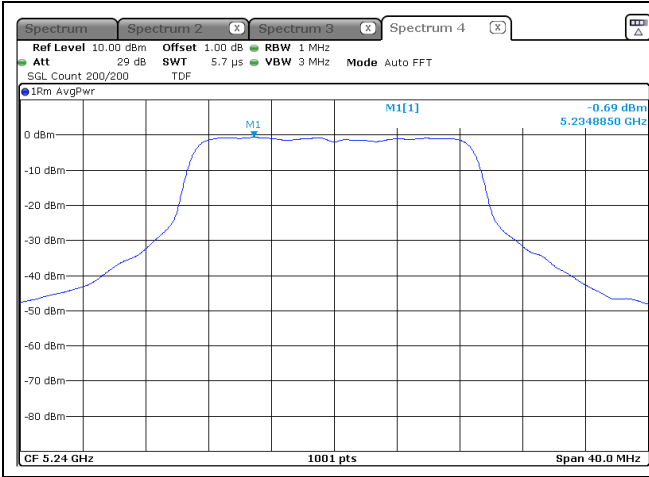
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



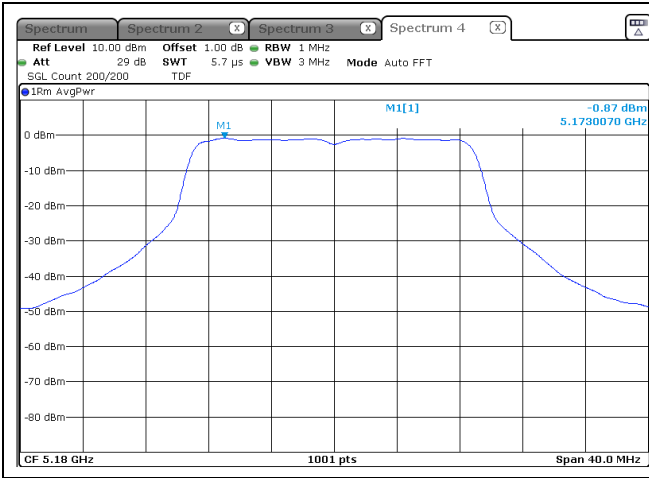
MIMO 3Tx (ANT 3)



- 802.11ac VHT20

- 5 180 MHz

MIMO 3Tx (ANT 1)



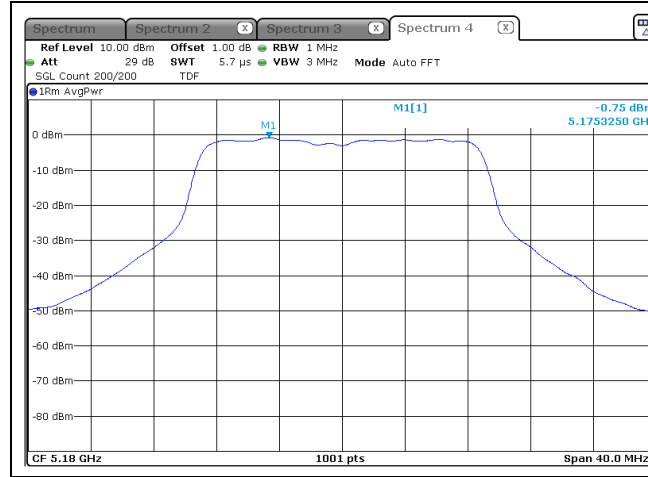
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Suwon-si, Gyeonggi-do, 443-390, Korea
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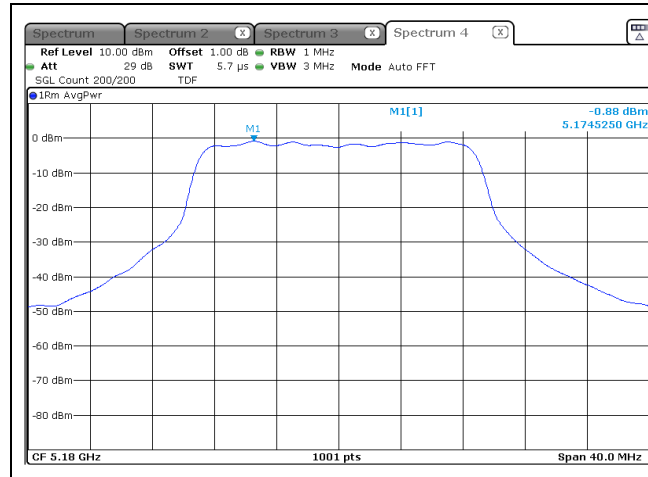
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MIMO 3Tx (ANT 2)

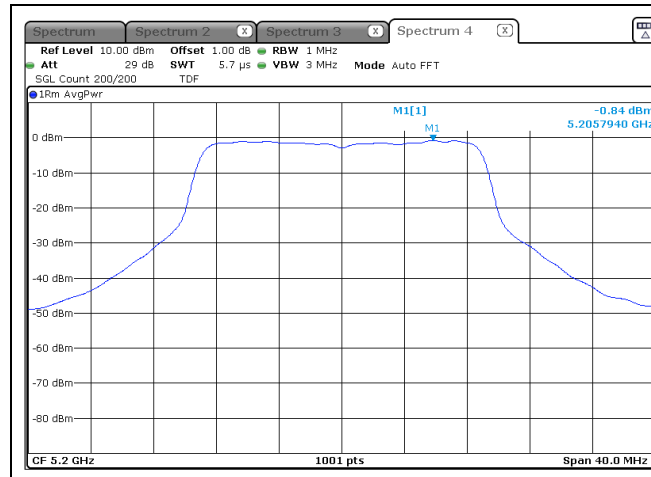


MIMO 3Tx (ANT 3)

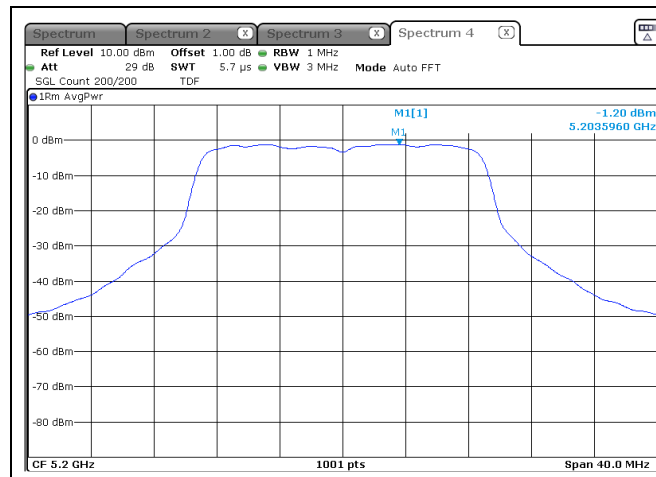


- 5 200 MHz

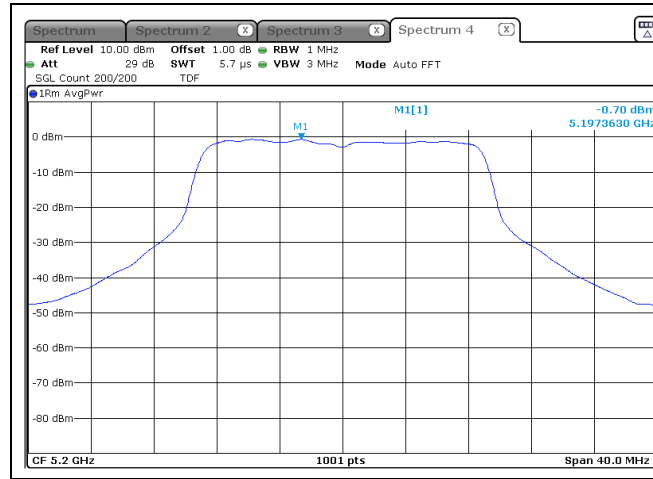
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)

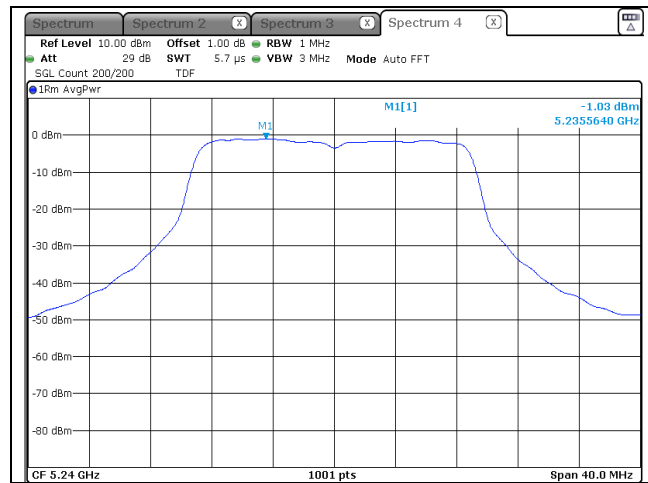


MIMO 3Tx (ANT 3)

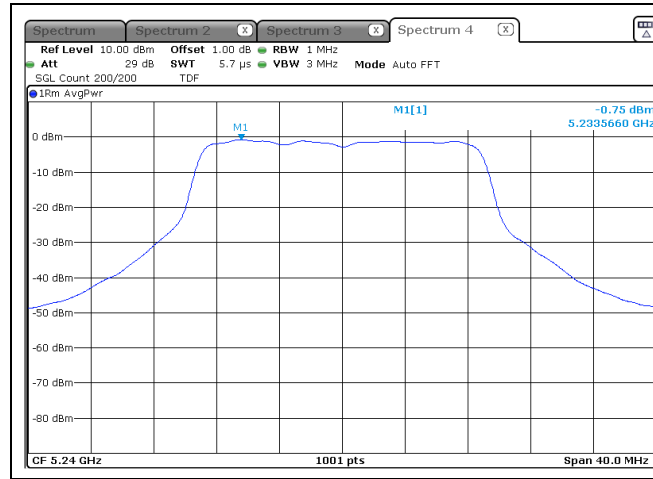


- 5 240 MHz

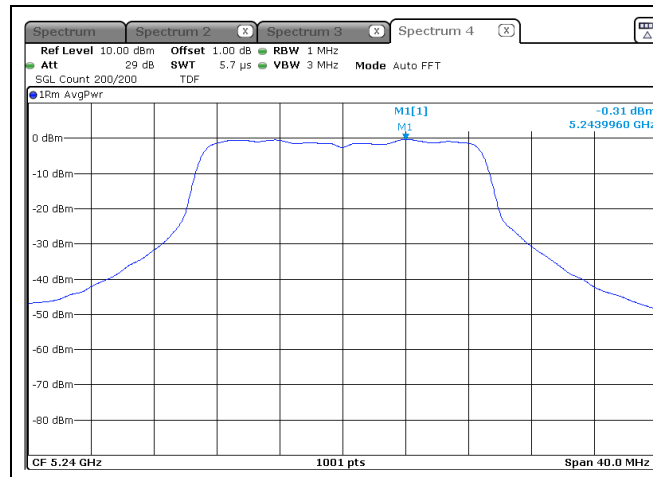
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



MIMO 3Tx (ANT 3)



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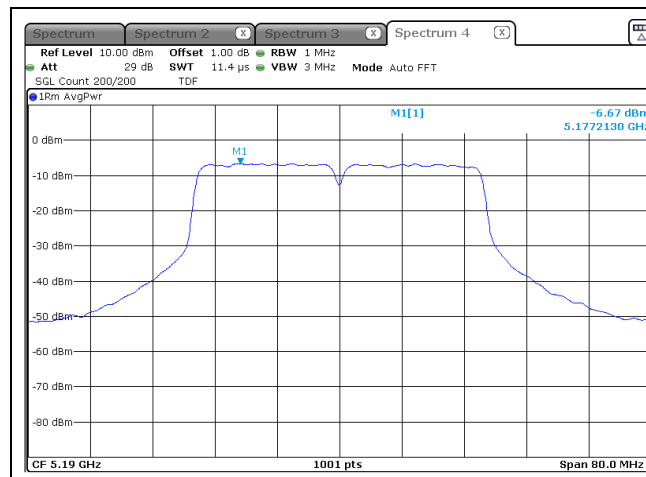
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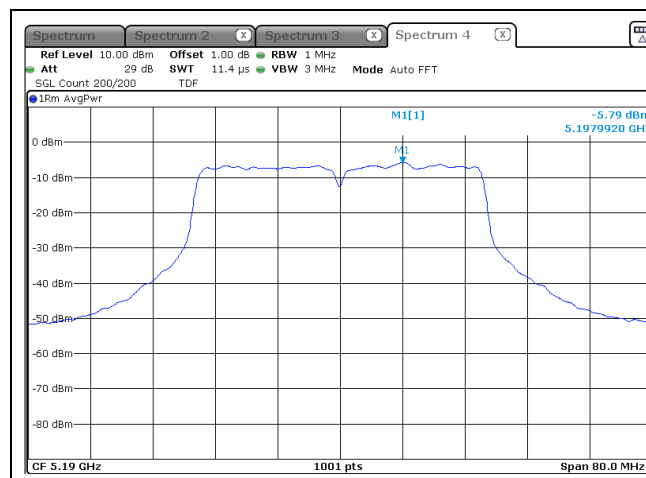
- 802.11n HT40

- 5 190 MHz

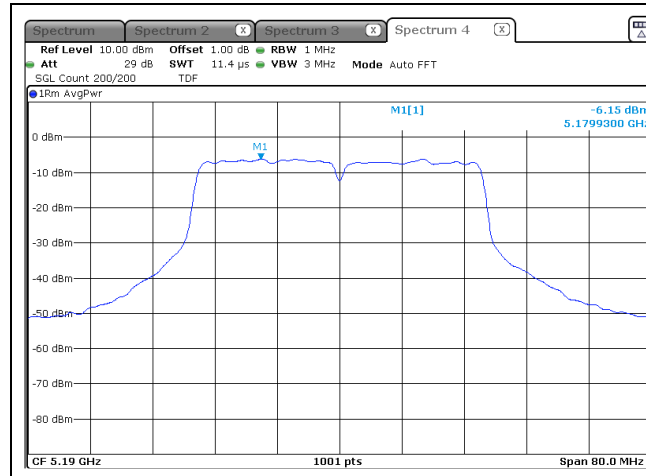
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)

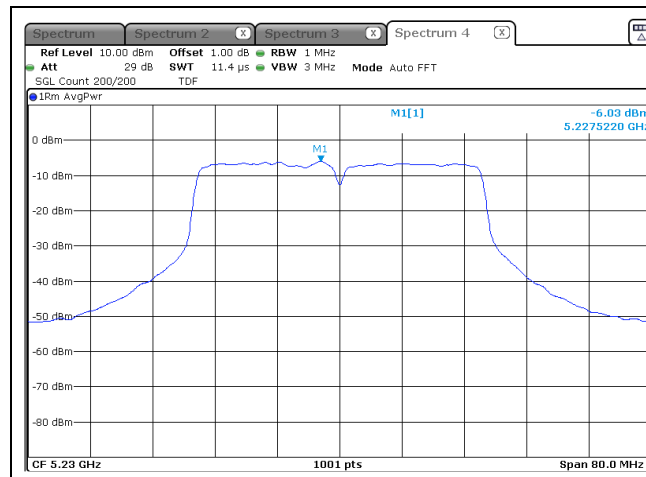


MIMO 3Tx (ANT 3)

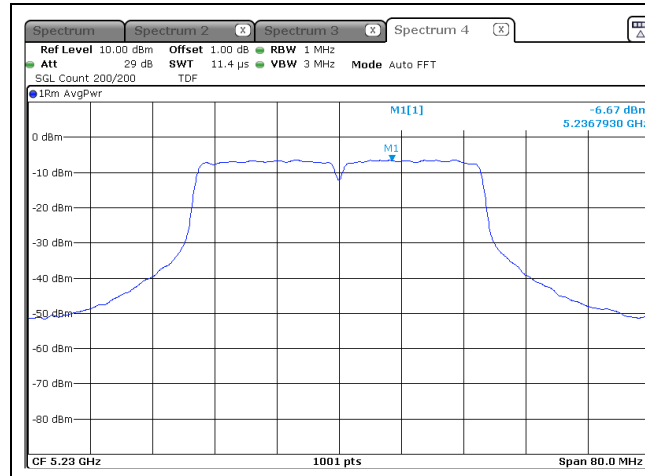


- 5 230 MHz

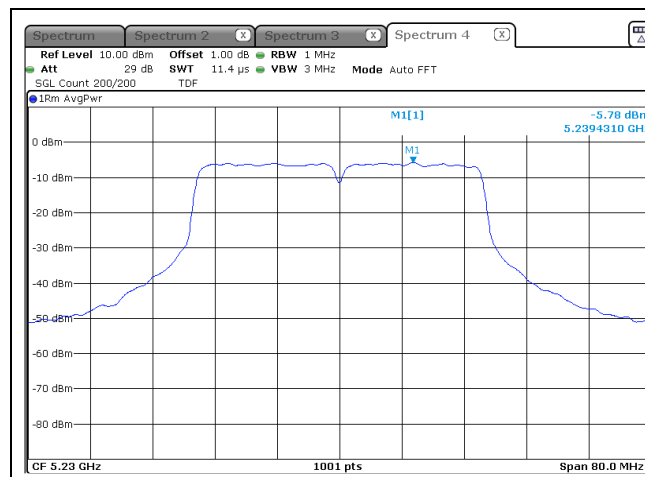
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



MIMO 3Tx (ANT 3)



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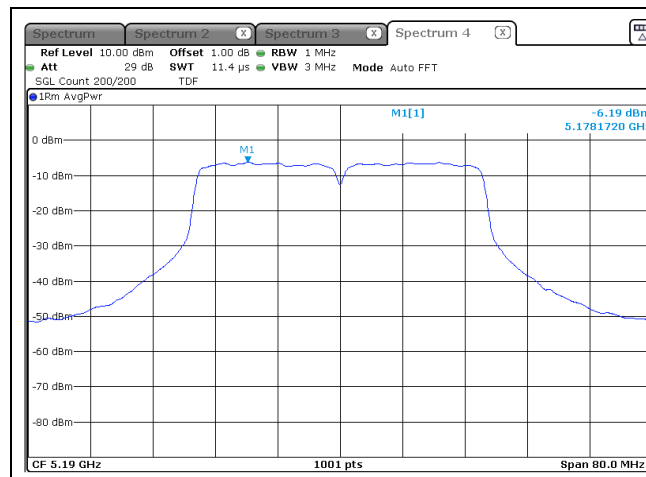
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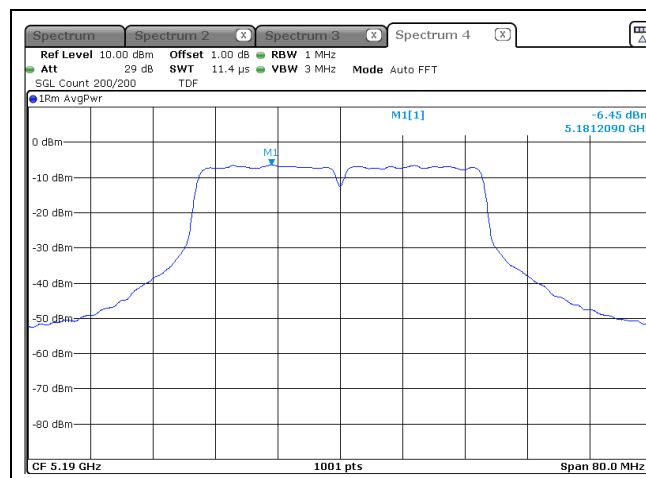
- 802.11ac VHT40

- 5 190 MHz

MIMO 3Tx (ANT 1)



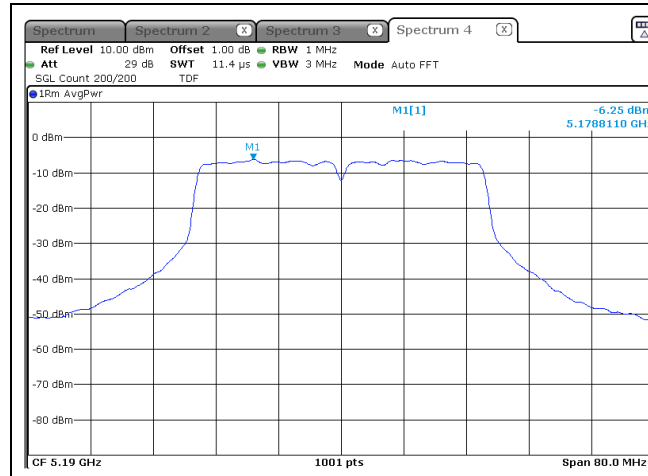
MIMO 3Tx (ANT 2)



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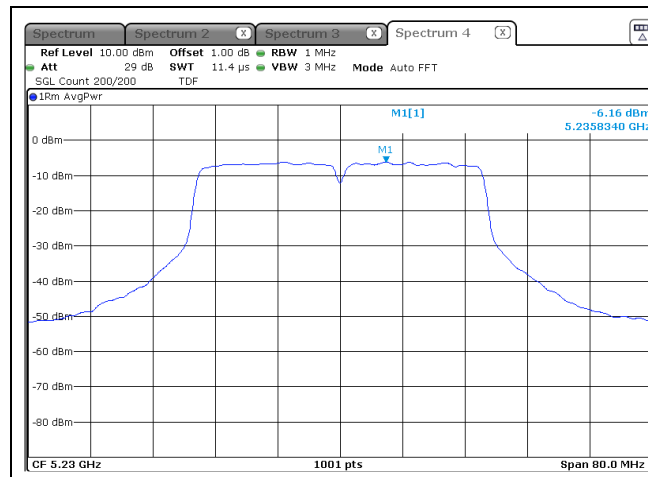
KCTL-TIR001-003/0

MIMO 3Tx (ANT 3)

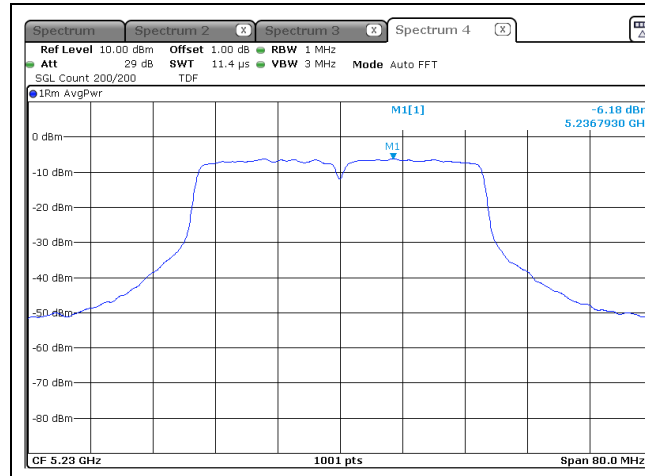


- 5 230 MHz

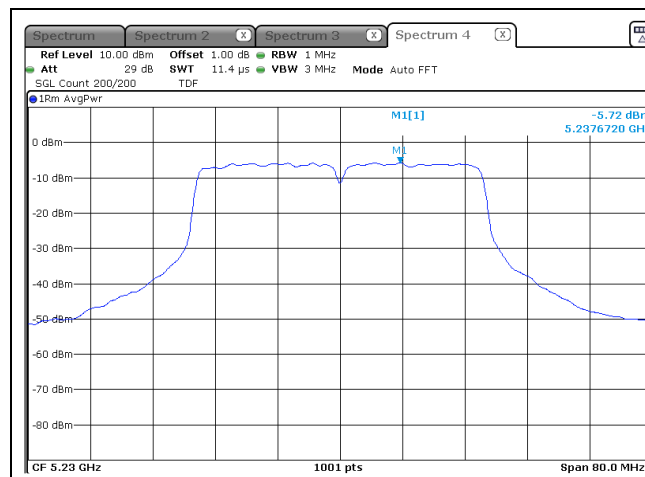
MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



MIMO 3Tx (ANT 3)



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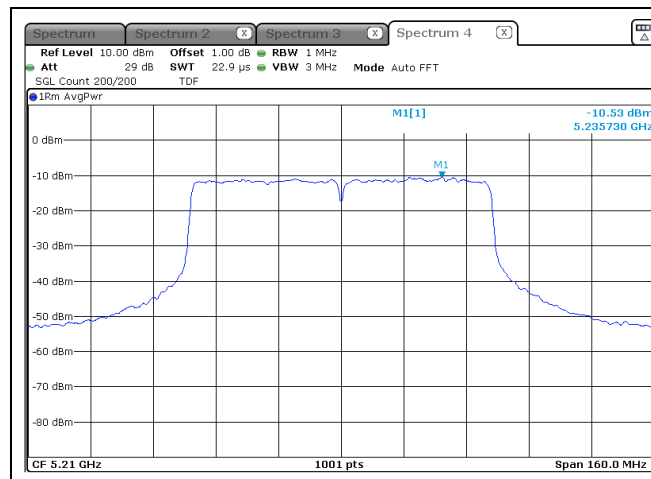
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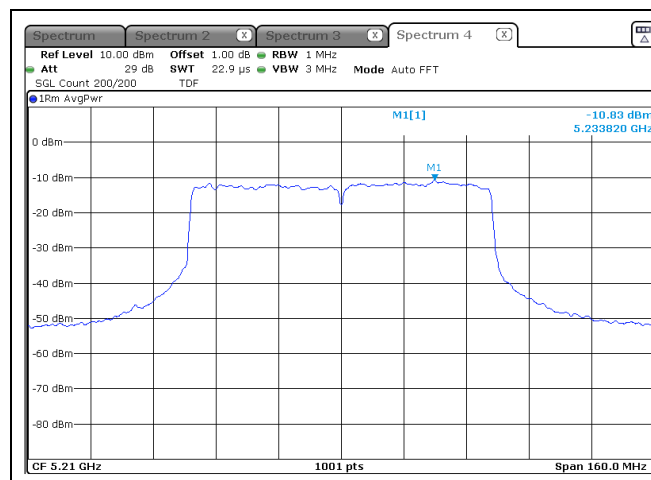
- 802.11ac VHT80

- 5 210 MHz

MIMO 3Tx (ANT 1)



MIMO 3Tx (ANT 2)



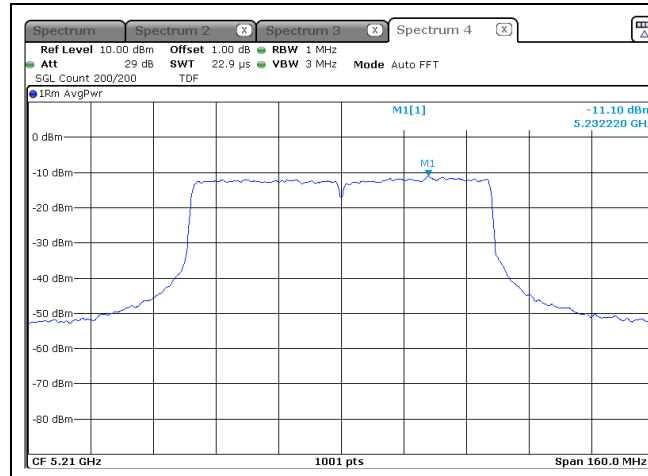
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MIMO 3Tx (ANT 3)



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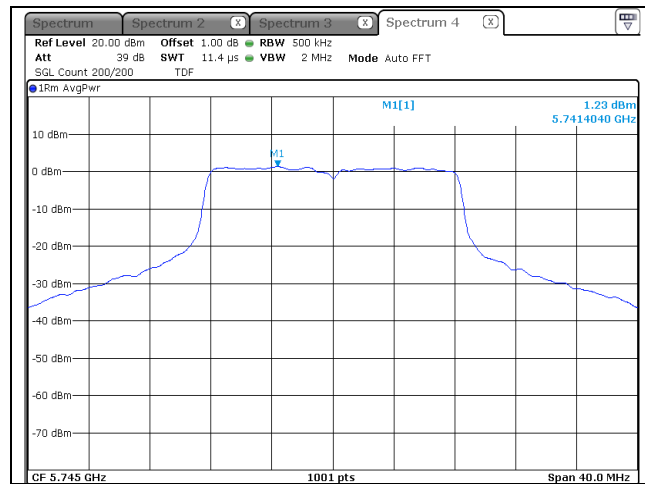


- 5 725 Band

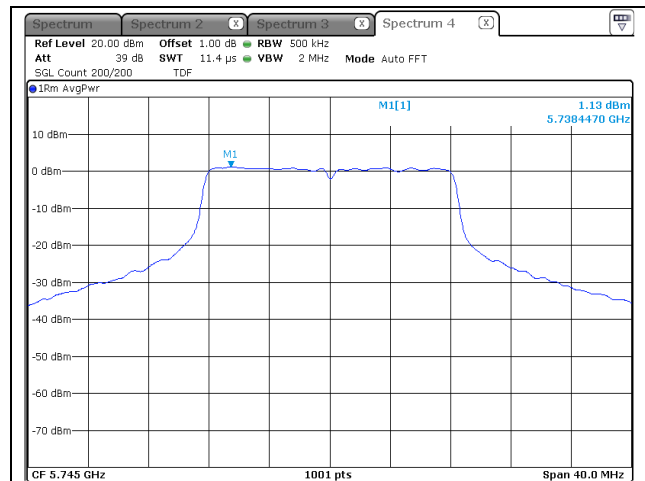
- 802.11a

- 5 745 MHz

ANT 1



ANT 2



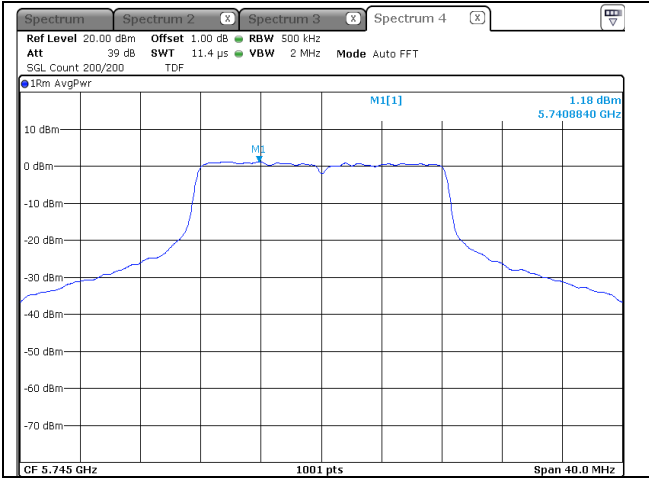
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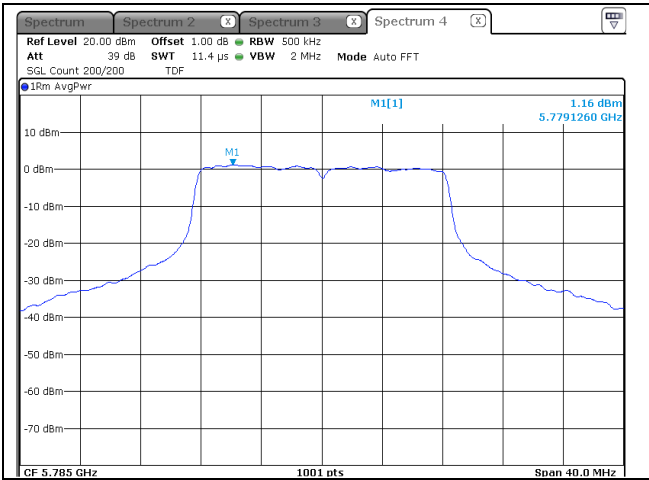


ANT 3



- 5 785 MHz

ANT 1



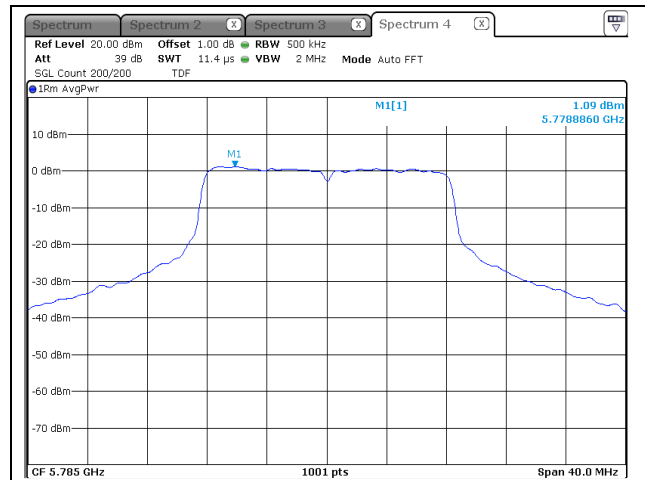
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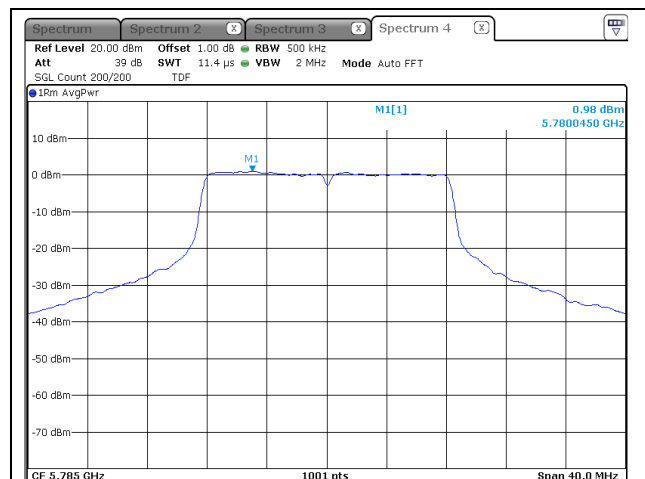
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ANT 2



ANT 3



KCTL Inc.

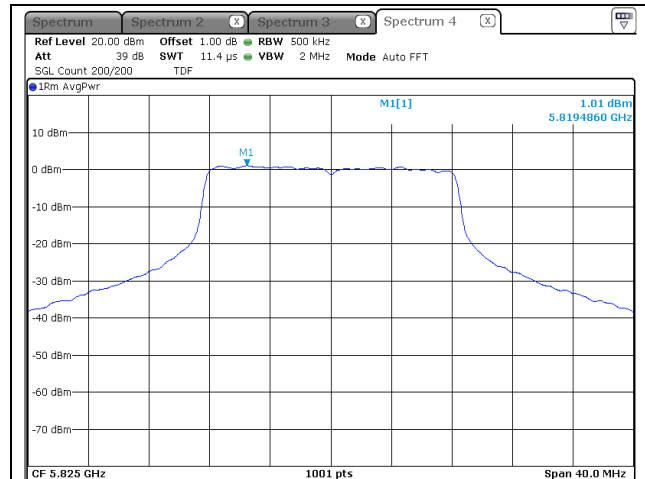
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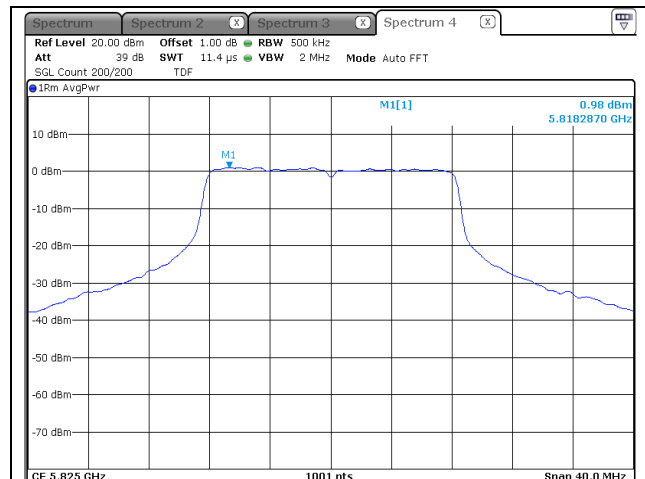


- 5 825 MHz

ANT 1



ANT 2



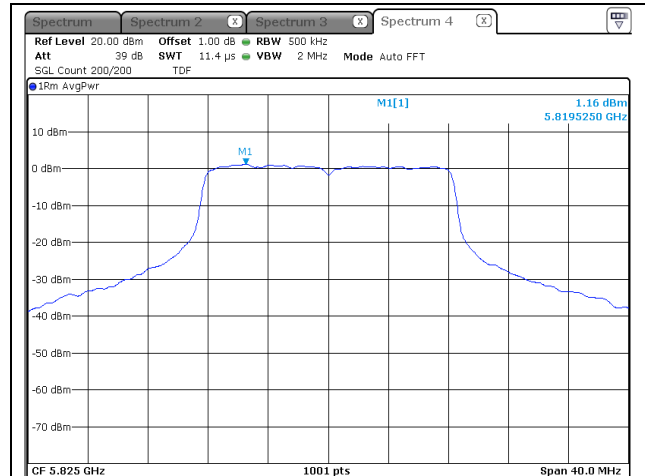
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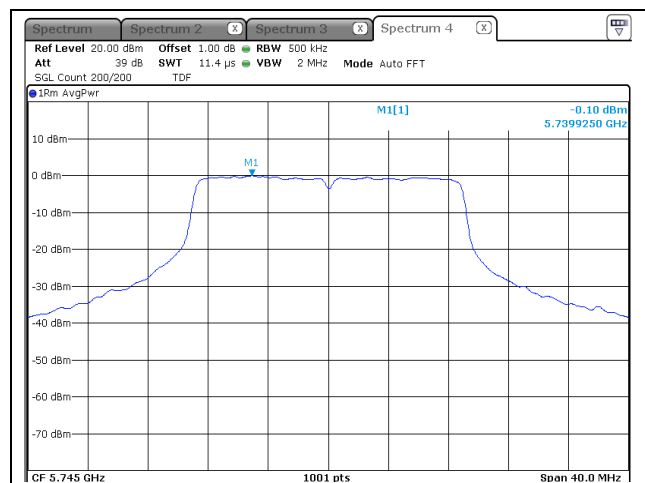
ANT 3



- 802.11n HT20

- 5 745 MHz

ANT 1



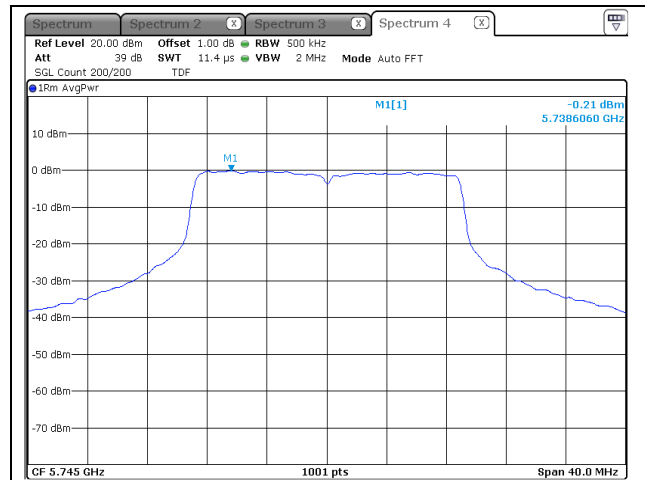
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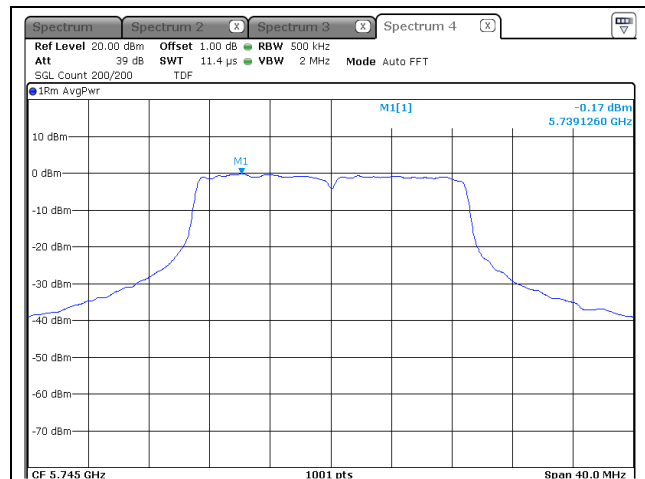
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ANT 2

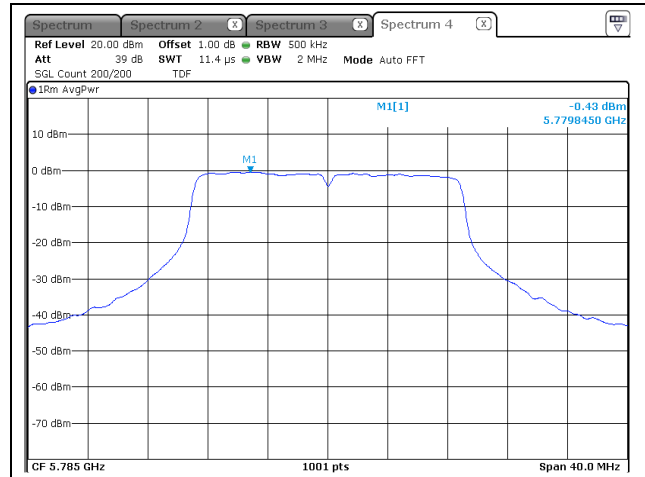


ANT 3

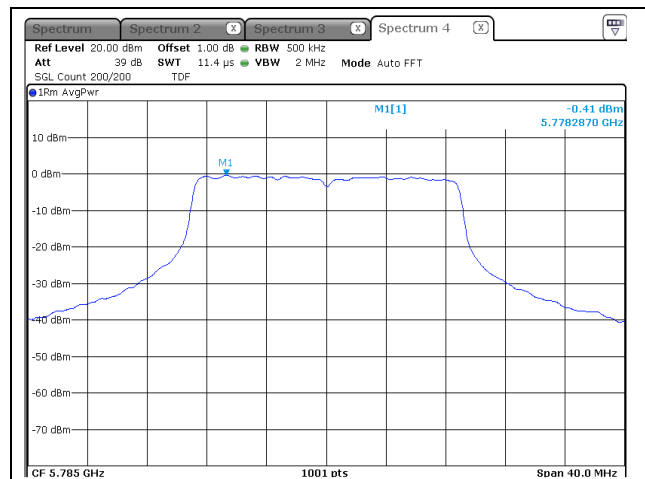


- 5 785 MHz

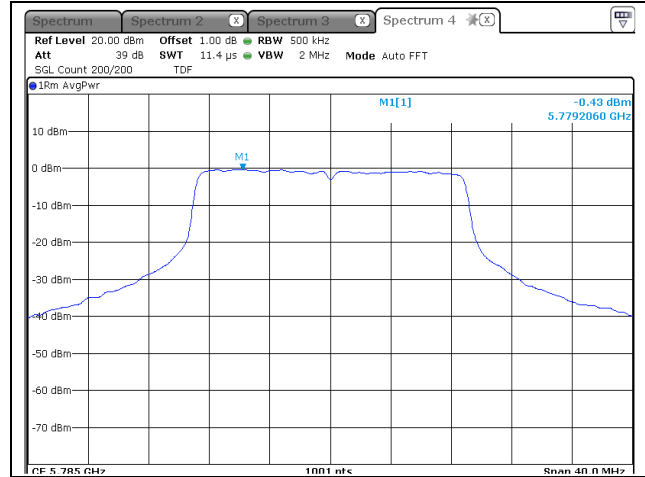
ANT 1



ANT 2

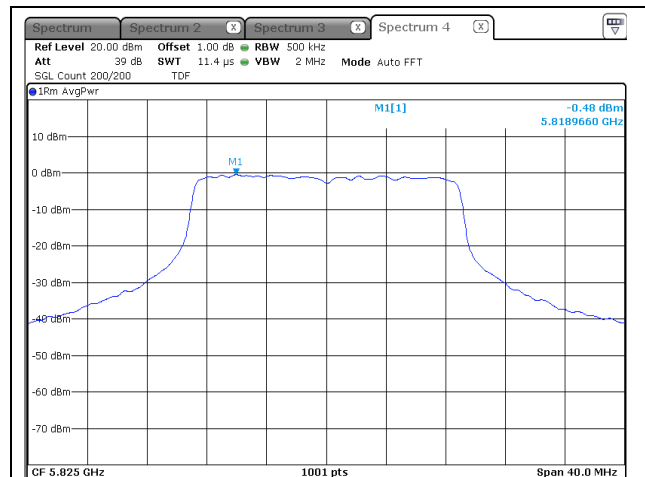


ANT 3



- 5 825 MHz

ANT 1



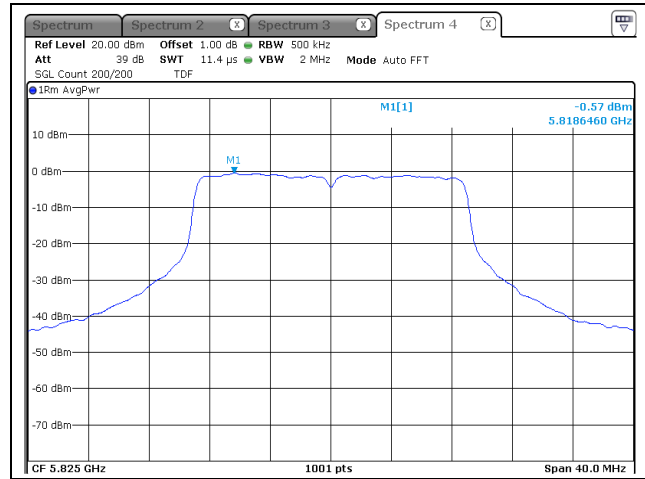
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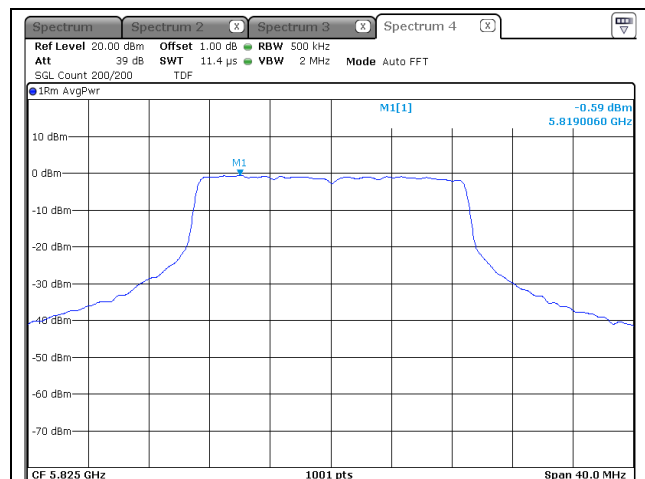
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ANT 2



ANT 3



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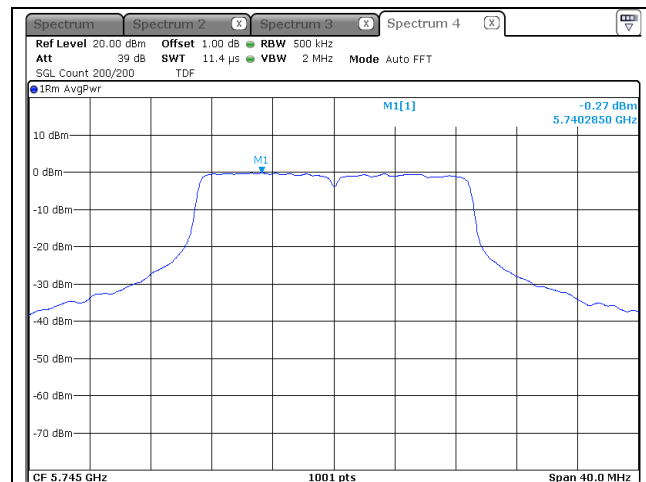
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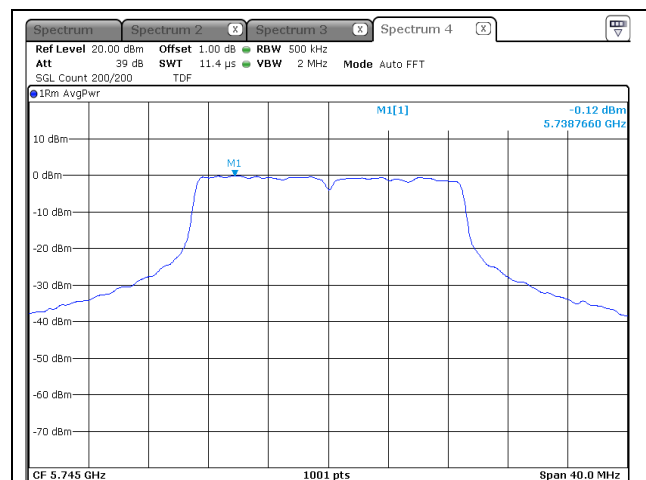
- 802.11ac VTH20

- 5 745 MHz

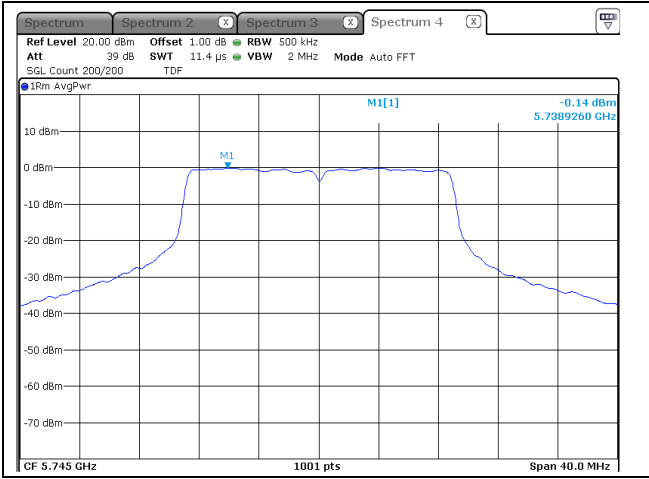
ANT 1



ANT 2

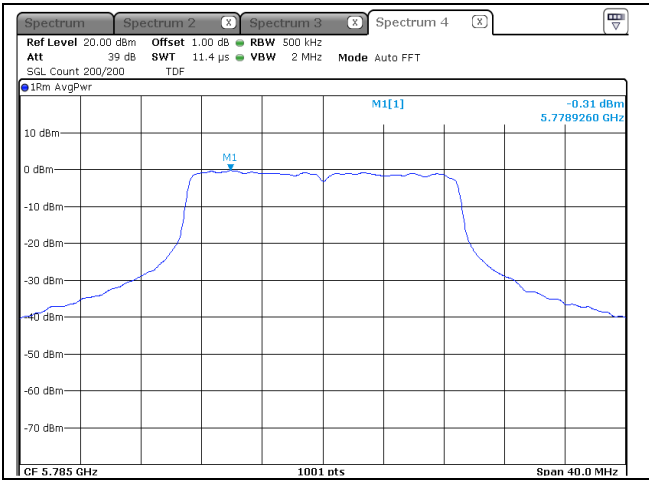


ANT 3



- 5 785 MHz

ANT 1



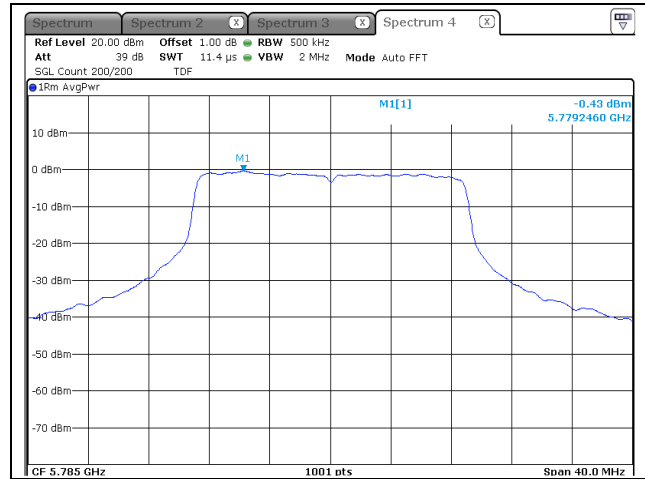
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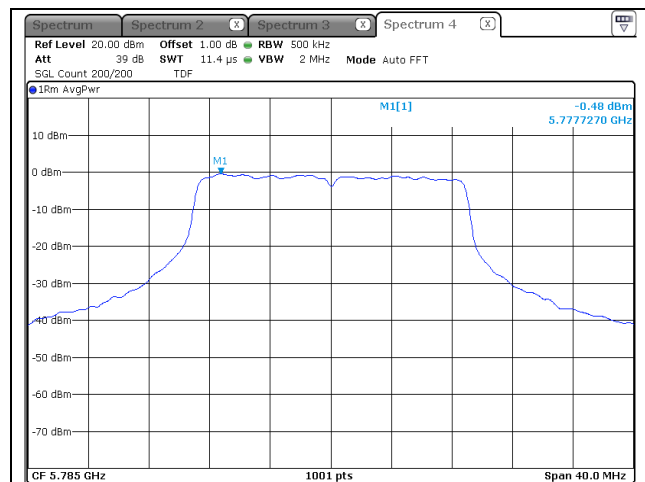
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ANT 2



ANT 3



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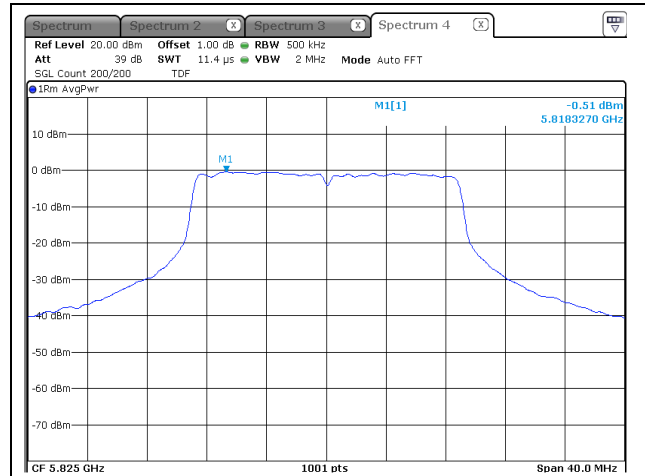
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- 5 825 MHz

ANT 1



ANT 2

