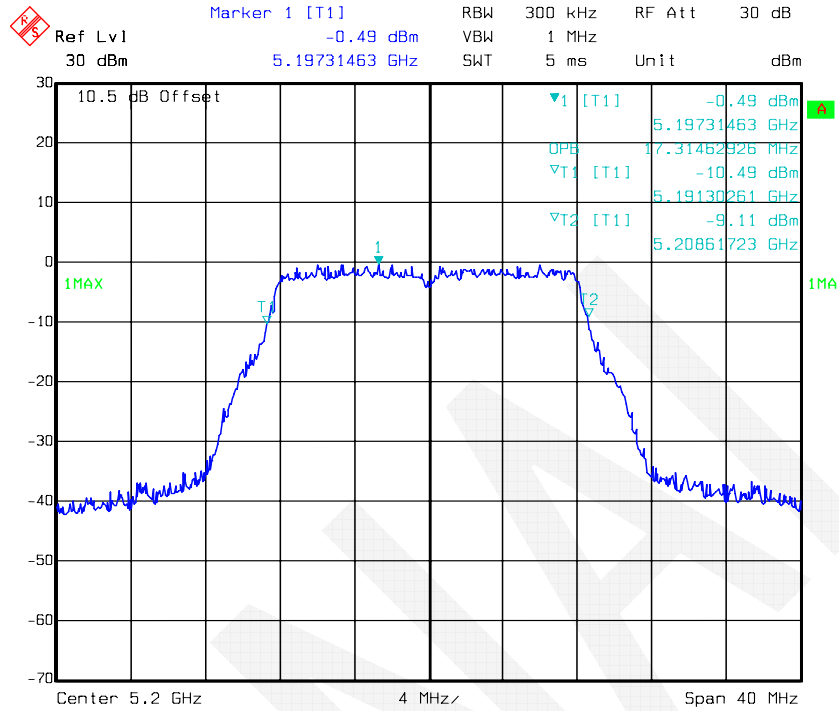
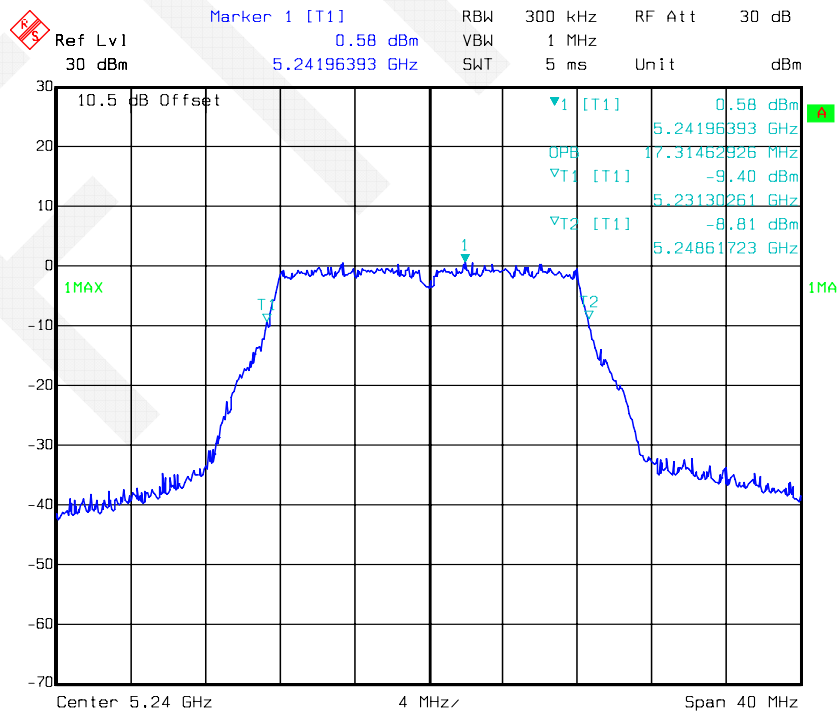


802.11a mode, 99% Occupied Bandwidth -5200 MHz, Antenna 1



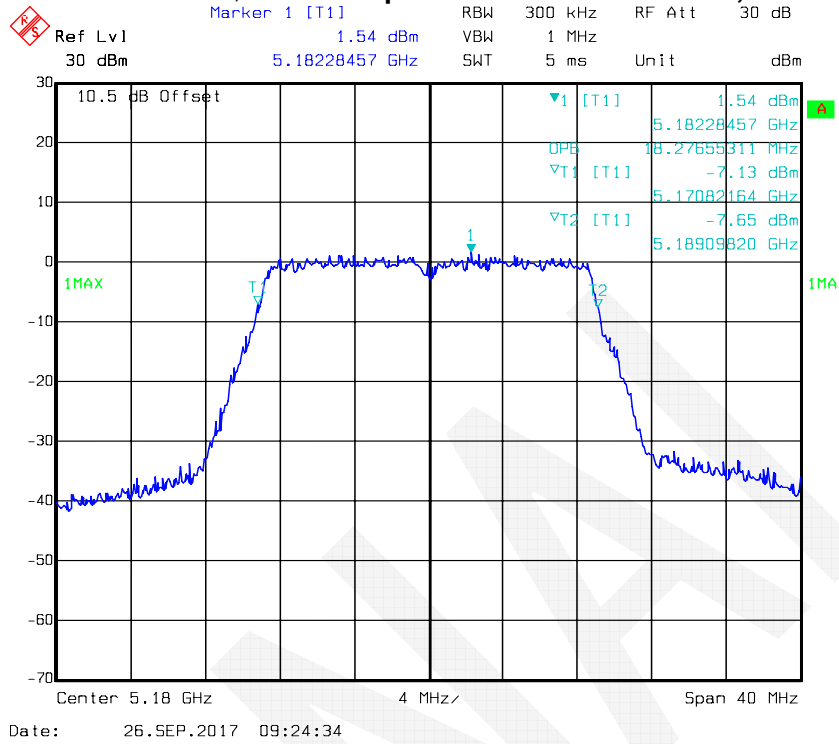
Date: 26.SEP.2017 10:20:37

802.11a mode, 99% Occupied Bandwidth -5240 MHz, Antenna 1

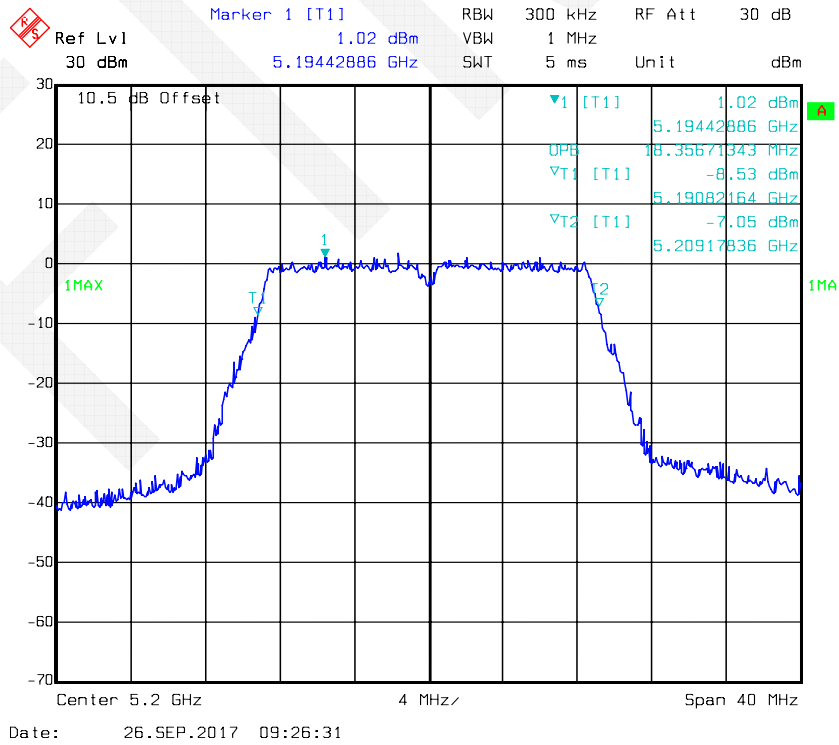


Date: 26.SEP.2017 10:21:50

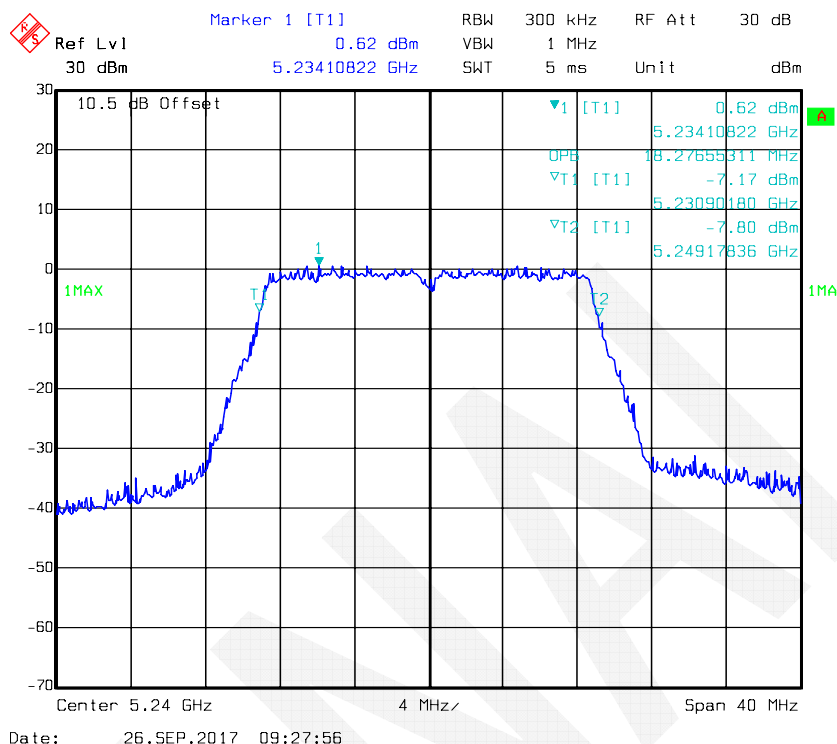
802.11n-HT20 mode, 99% Occupied Bandwidth-5180 MHz, Antenna 0



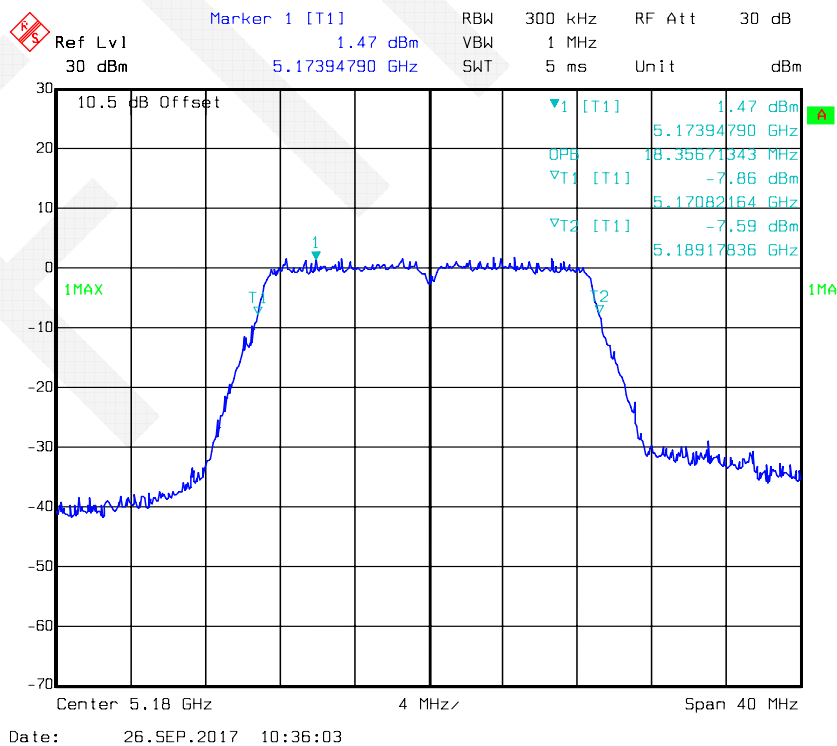
802.11n-HT20 mode, 99% Occupied Bandwidth -5200 MHz, Antenna 0



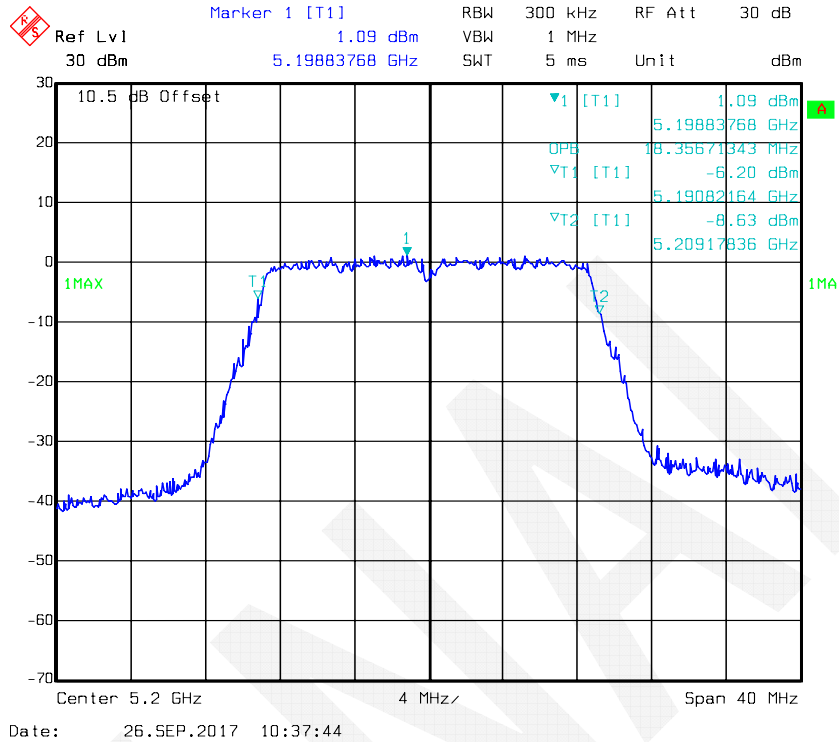
802.11n-HT20 mode, 99% Occupied Bandwidth -5240 MHz, Antenna 0



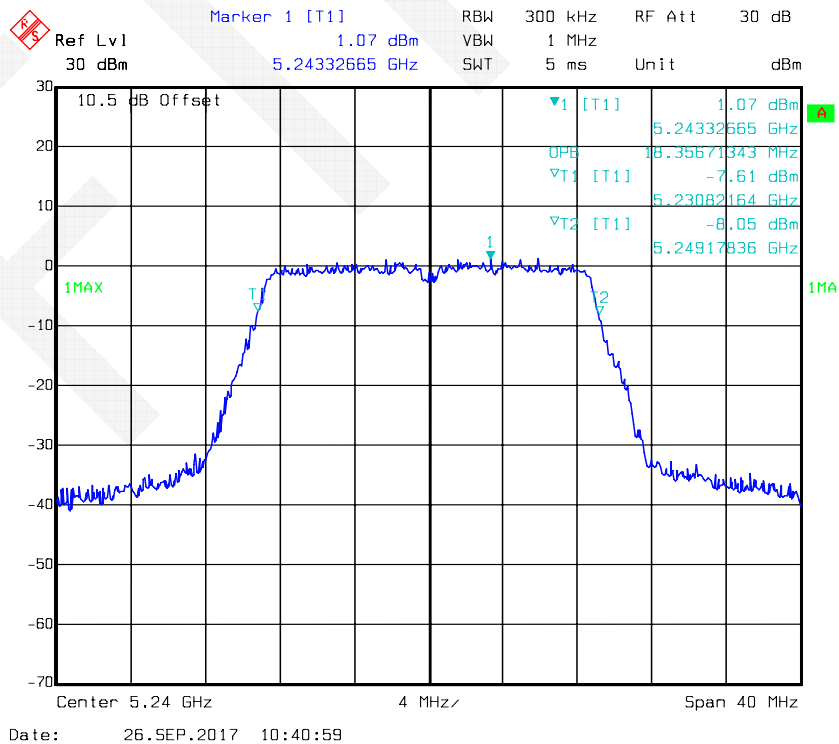
802.11n-HT20 mode, 99% Occupied Bandwidth-5180 MHz, Antenna 1



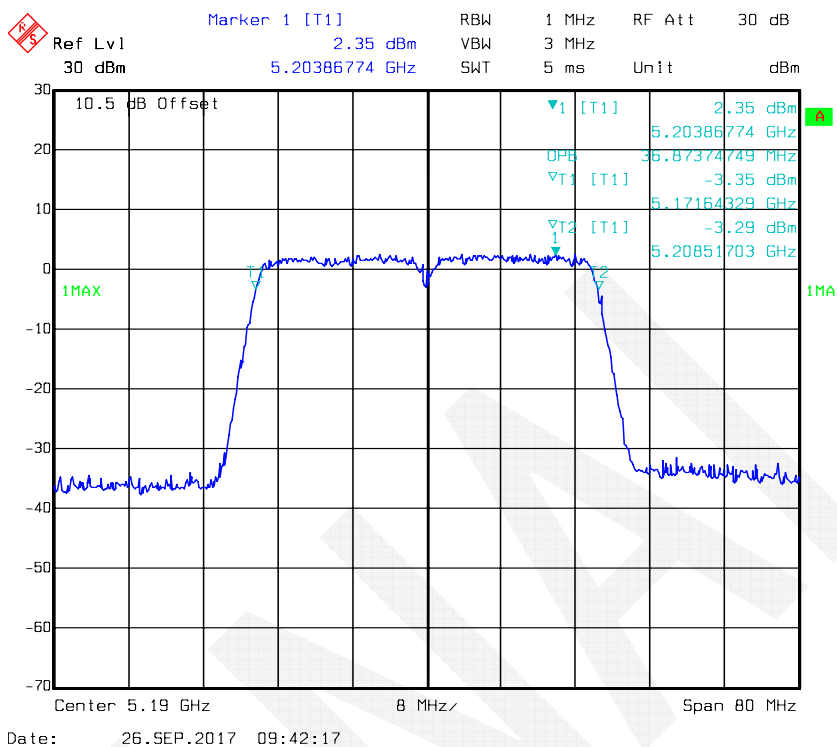
802.11n-HT20 mode, 99% Occupied Bandwidth -5200 MHz, Antenna 1



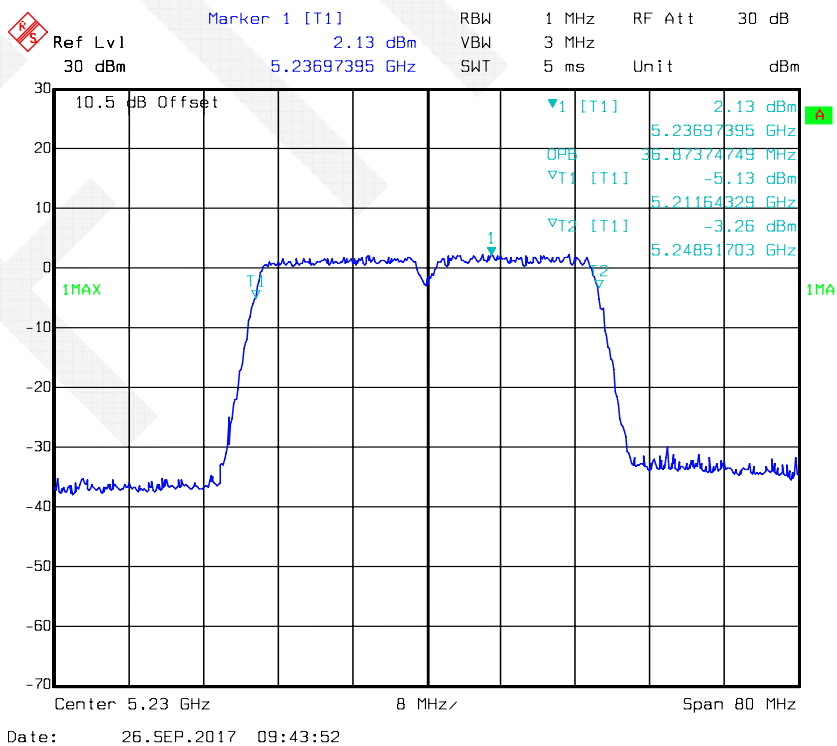
802.11n-HT20 mode, 99% Occupied Bandwidth -5240 MHz, Antenna 1



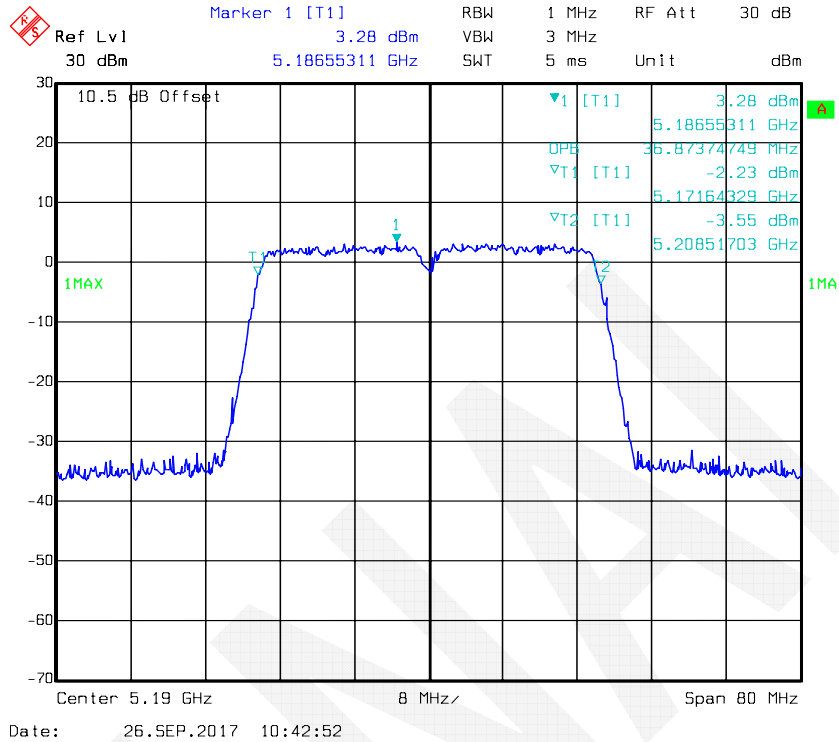
802.11n-HT40 mode, 99% Occupied Bandwidth-5190 MHz, Antenna 0



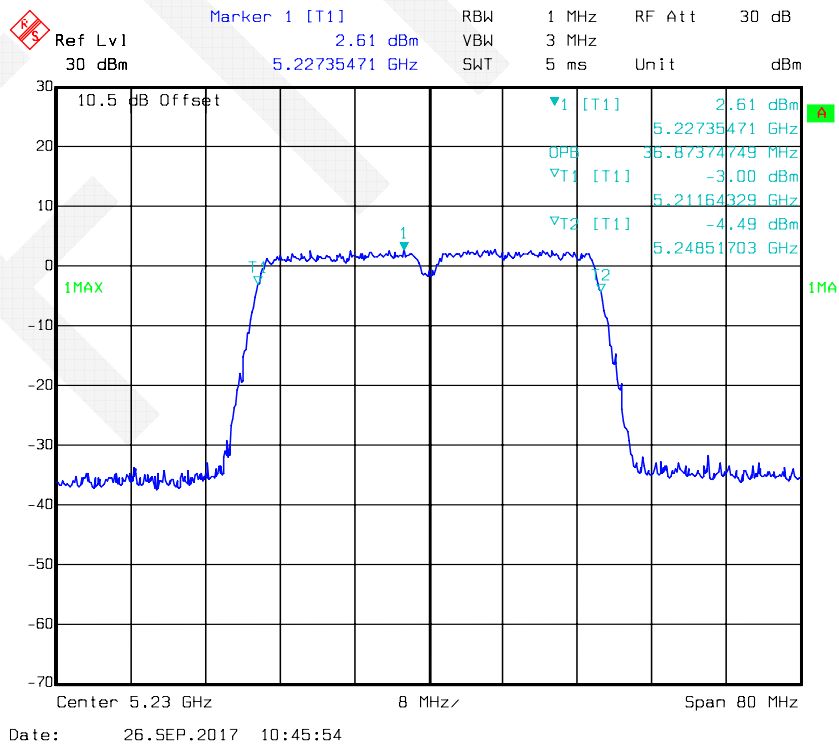
802.11n-HT40 mode, 99% Occupied Bandwidth-5230 MHz, Antenna 0



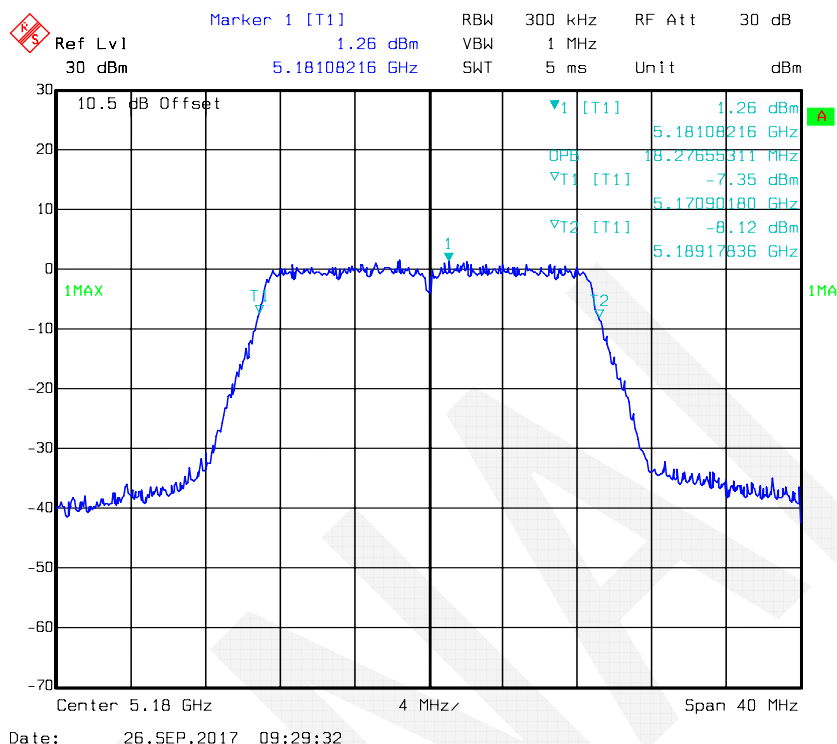
802.11n-HT40 mode, 99% Occupied Bandwidth-5190 MHz, Antenna 1



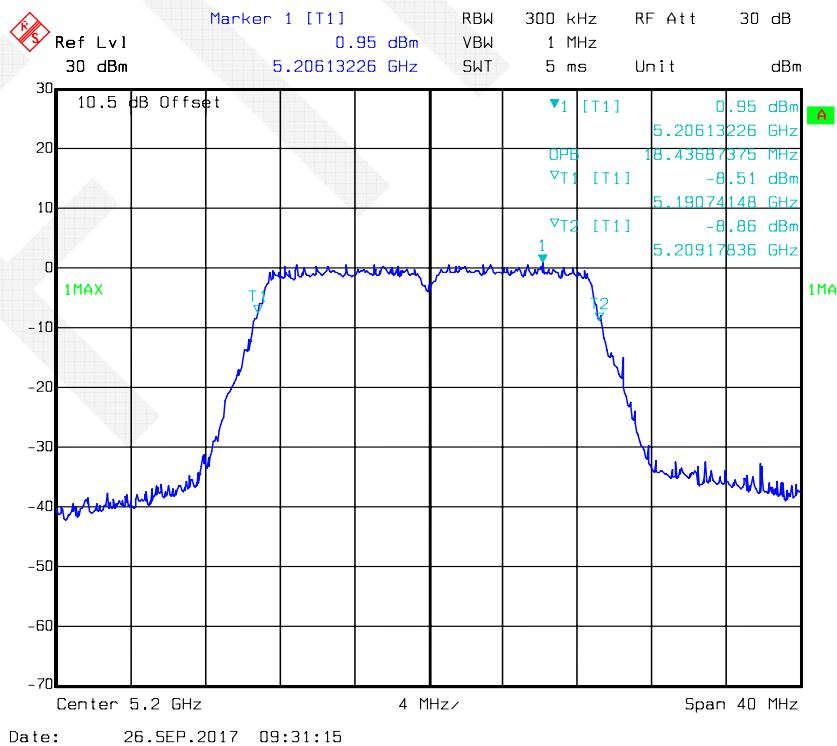
802.11n-HT40 mode, 99% Occupied Bandwidth-5230 MHz, Antenna 1



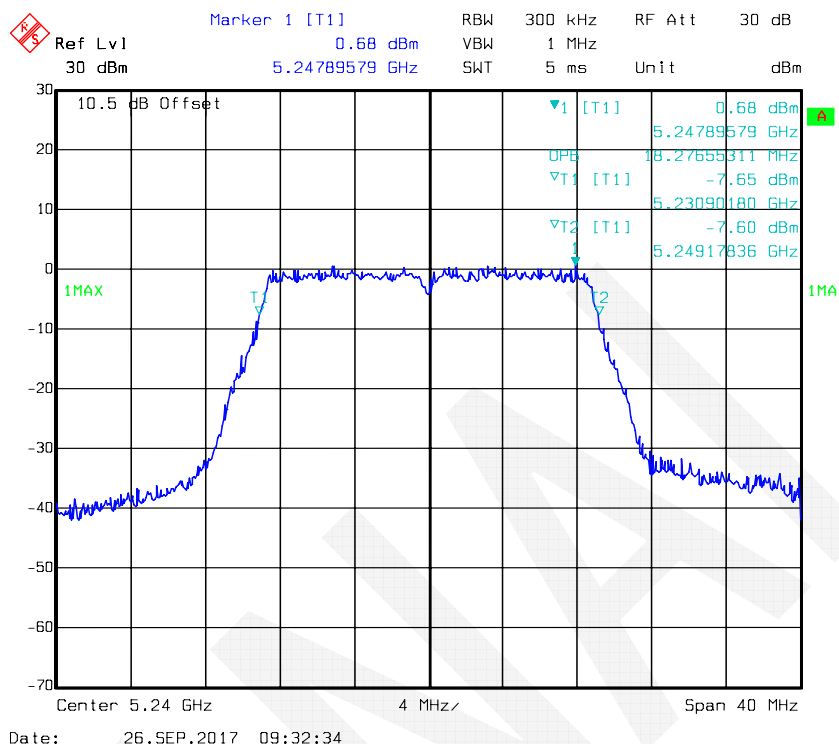
802.11ac20 mode, 99% Occupied Bandwidth-5180 MHz, Antenna 0



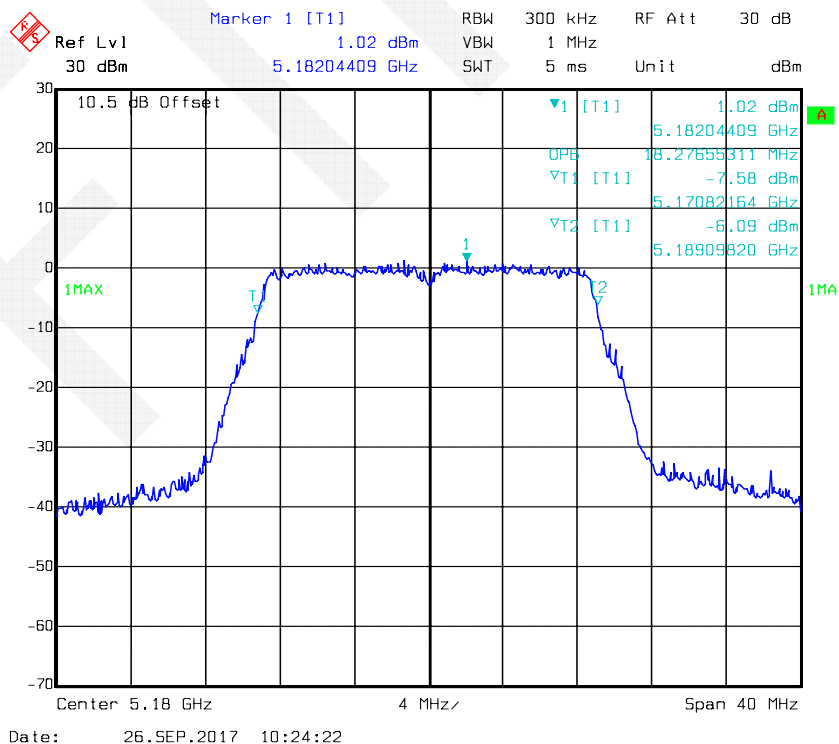
802.11ac20 mode, 99% Occupied Bandwidth-5200 MHz, Antenna 0



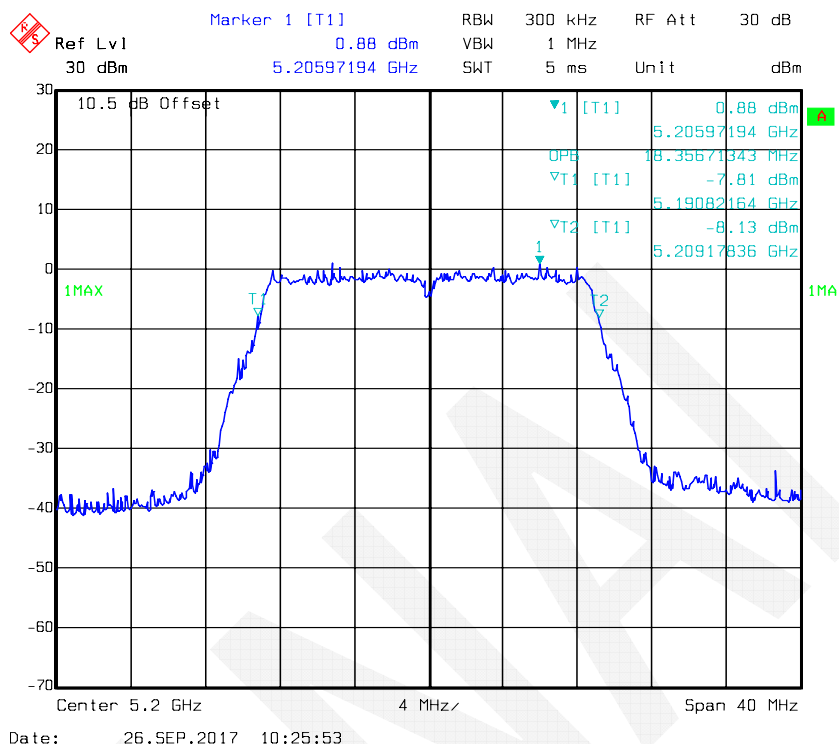
802.11ac20 mode, 99% Occupied Bandwidth-5240 MHz, Antenna 0



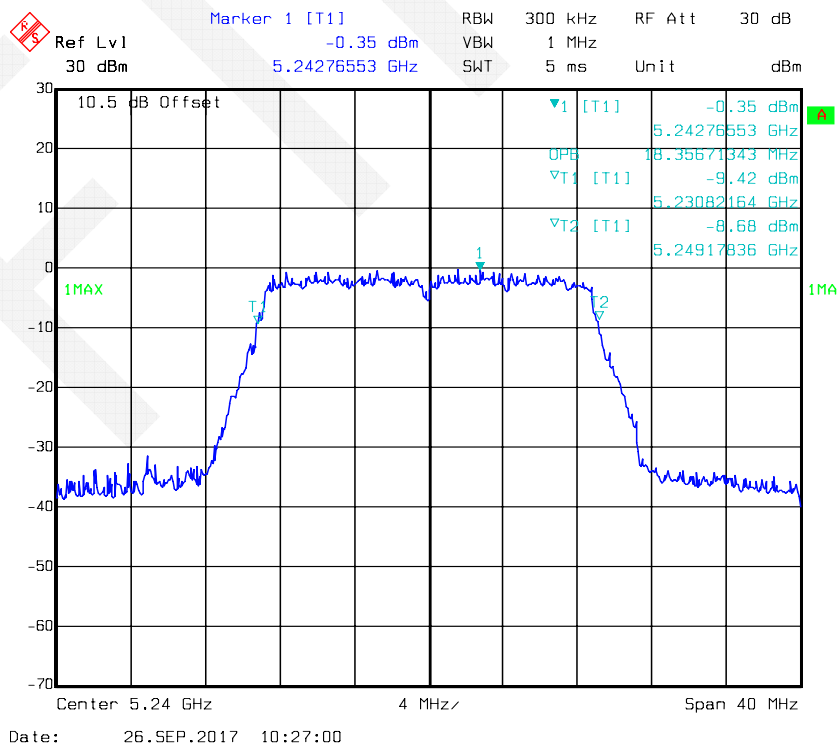
802.11ac20 mode, 99% Occupied Bandwidth-5180 MHz, Antenna 1



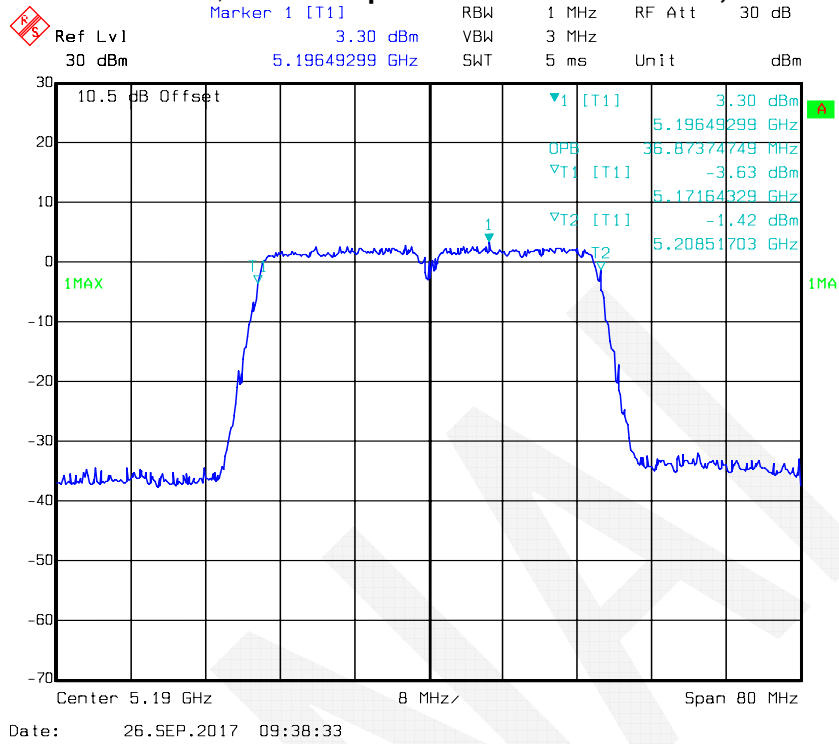
802.11ac20 mode, 99% Occupied Bandwidth-5200 MHz, Antenna 1



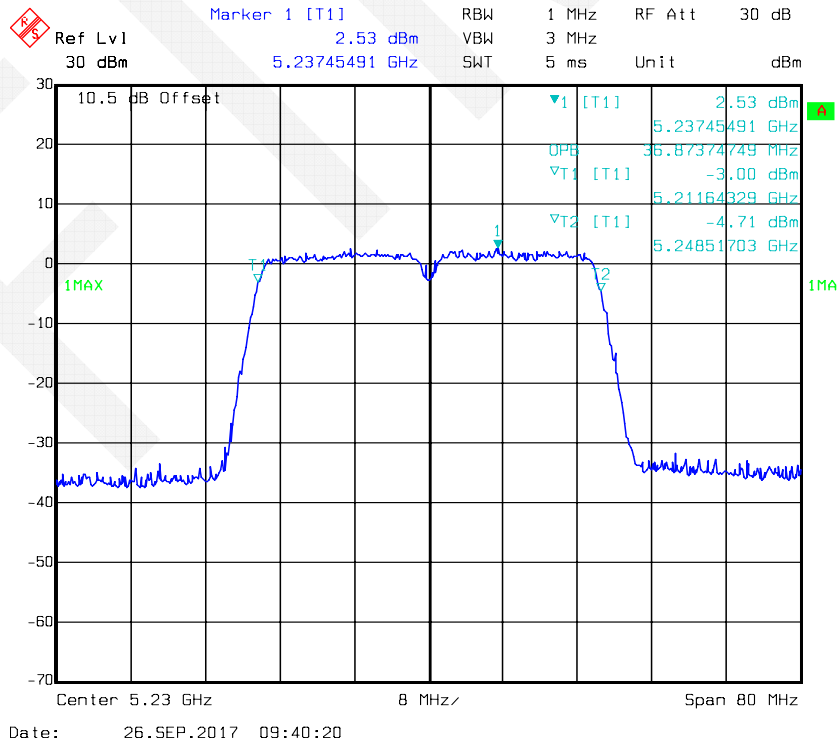
802.11ac20 mode, 99% Occupied Bandwidth-5240 MHz, Antenna 1



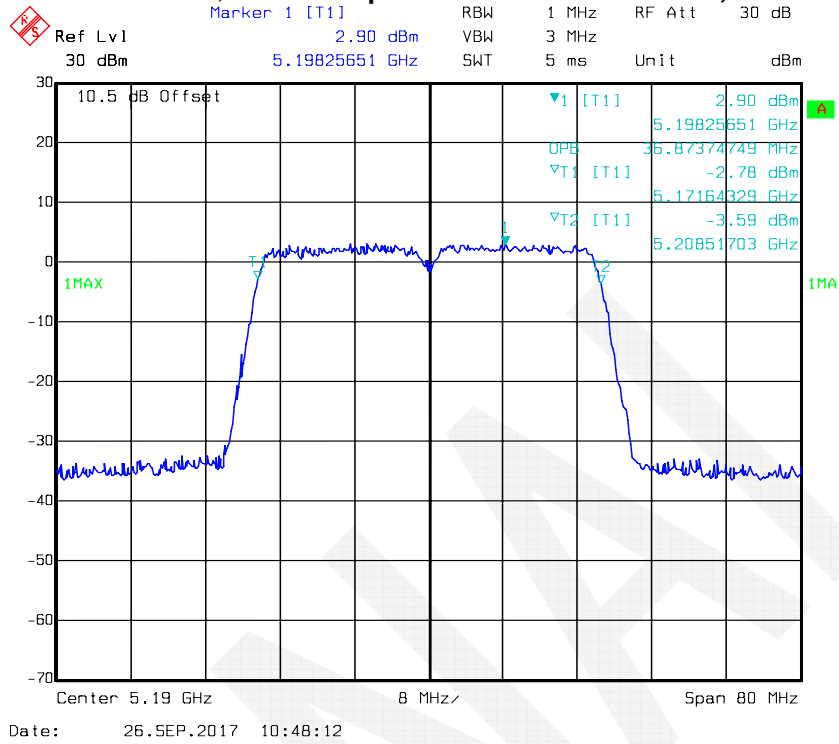
802.11ac40 mode, 99% Occupied Bandwidth-5190 MHz, Antenna 0



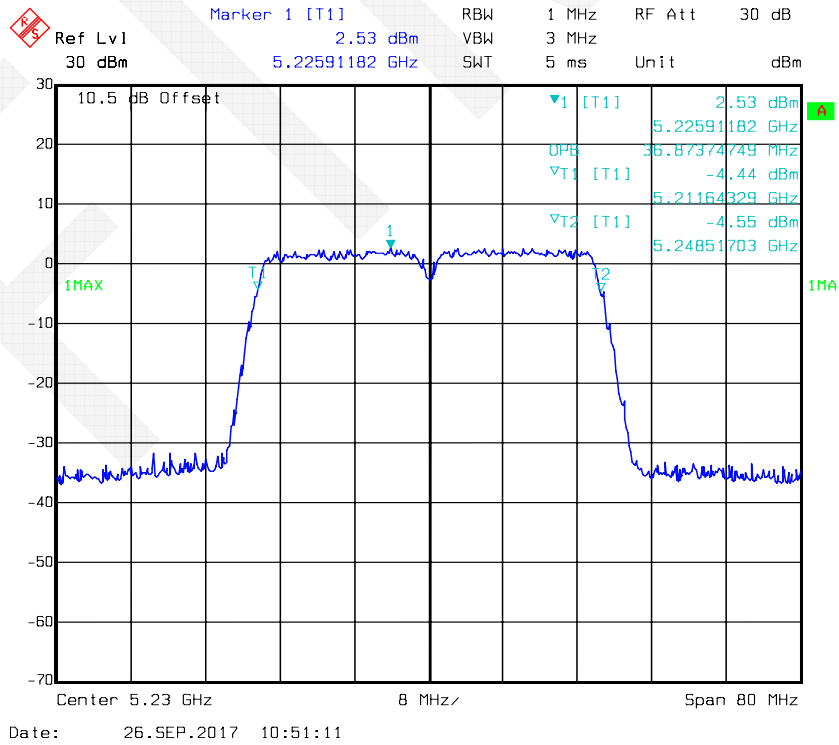
802.11ac40 mode, 99% Occupied Bandwidth-5230 MHz, Antenna 0



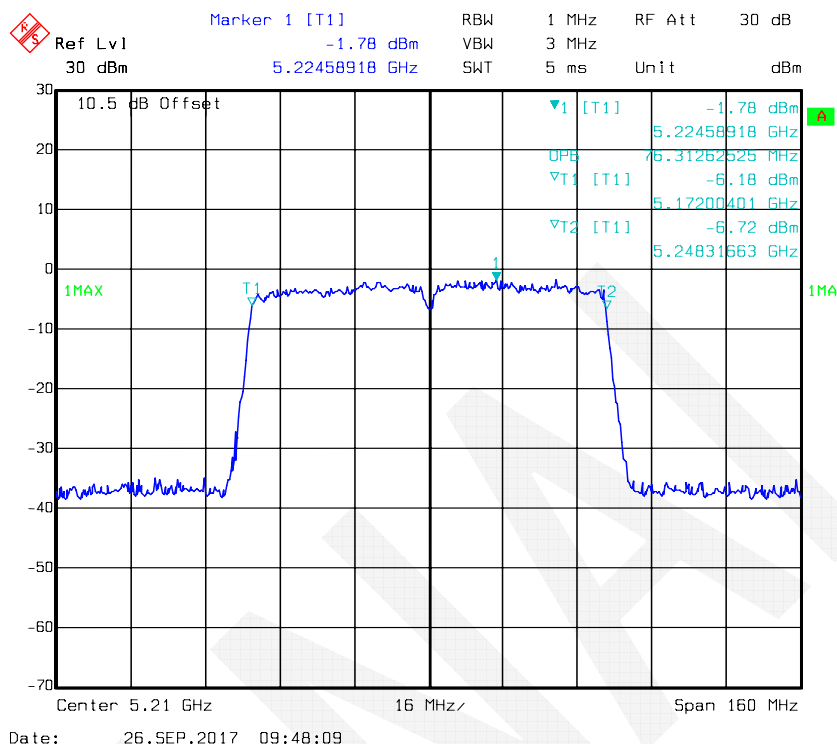
802.11ac40 mode, 99% Occupied Bandwidth-5190 MHz, Antenna 1



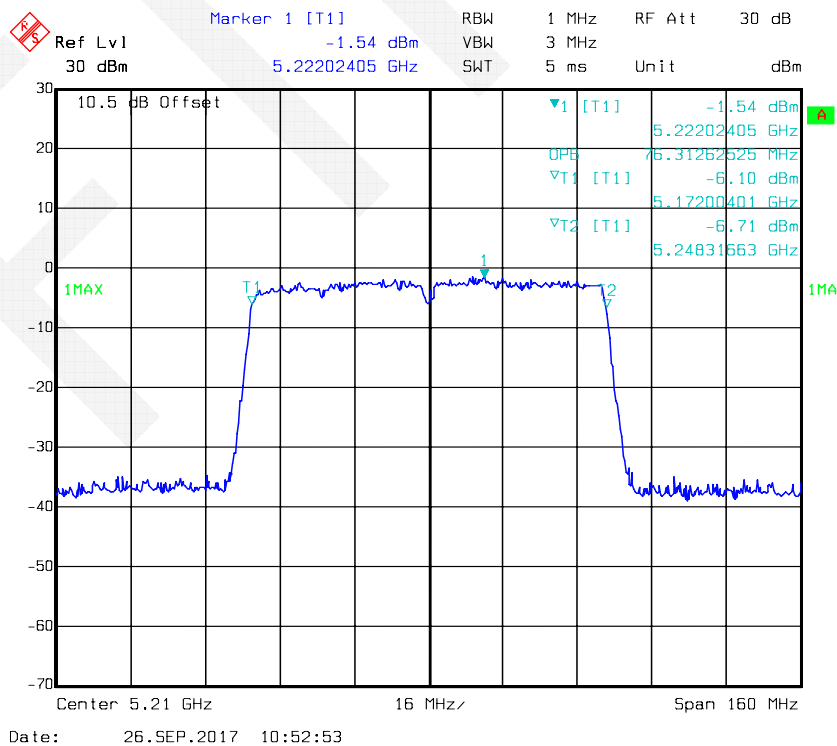
802.11ac40 mode, 99% Occupied Bandwidth-5230 MHz, Antenna 1



802.11ac80 mode, 99% Occupied Bandwidth-5210 MHz, Antenna 0



802.11ac80 mode, 99% Occupied Bandwidth-5210 MHz, Antenna 1

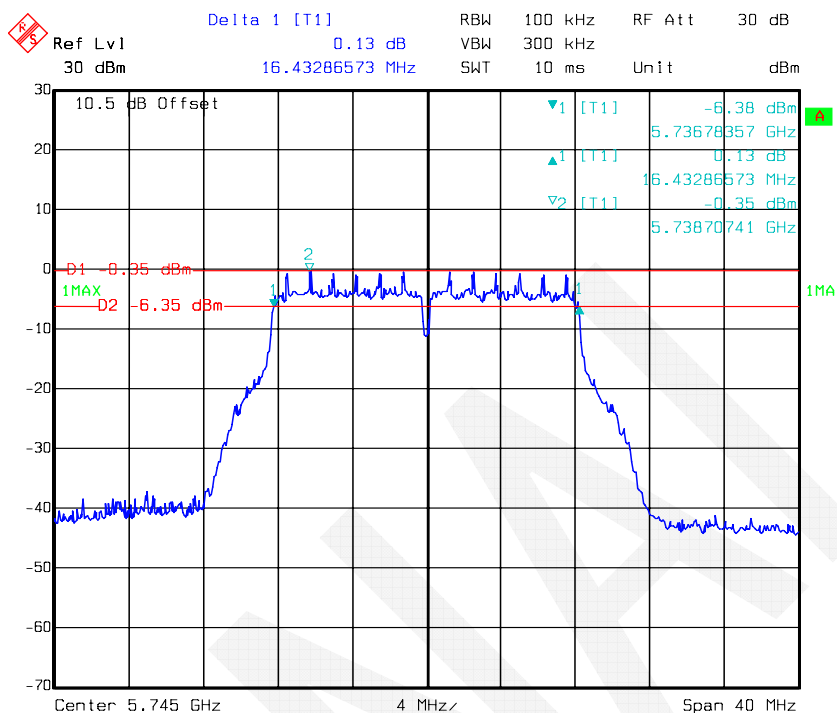


For 5725-5850 MHz:

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
			Antenna 0	Antenna 1	Antenna 0	Antenna 1
802.11a	Low	5745	16.43	16.43	17.23	17.31
	Middle	5785	16.43	16.43	17.23	17.39
	High	5825	16.43	16.43	17.31	17.31
802.11n-HT20	Low	5745	17.64	17.64	18.36	18.28
	Middle	5785	17.72	17.64	18.44	18.28
	High	5825	17.64	17.64	18.28	18.28
802.11n-HT40	Low	5755	36.39	36.39	36.87	36.87
	High	5795	36.39	36.39	36.87	36.87
802.11ac20	Low	5745	17.64	17.64	18.28	18.28
	Middle	5785	17.72	17.72	18.28	18.28
	High	5825	17.64	17.72	18.28	18.36
802.11ac40	Low	5755	36.39	36.55	36.87	37.03
	High	5795	36.39	36.39	36.87	37.03
802.11ac80	-	5775	76.31	76.31	76.31	76.31

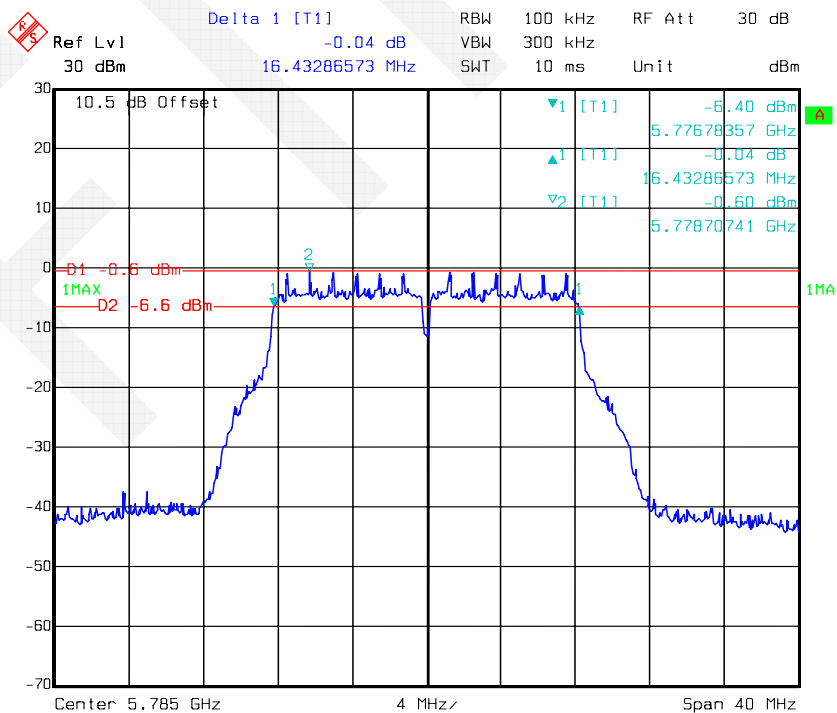
Note: the 99% Occupied Bandwidth doesn't extend U-NII-2C band 5470-5725MHz.

802.11a mode, 6 dB Bandwidth-5745 MHz, Antenna 0



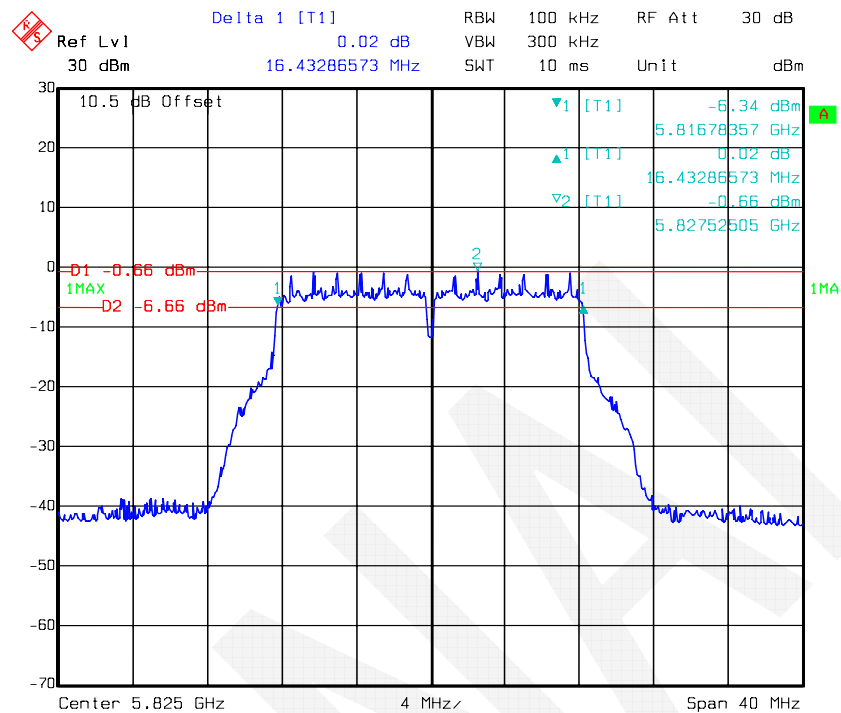
Date: 26.SEP.2017 13:17:11

802.11a mode, 6 dB Bandwidth-5785 MHz, Antenna 0



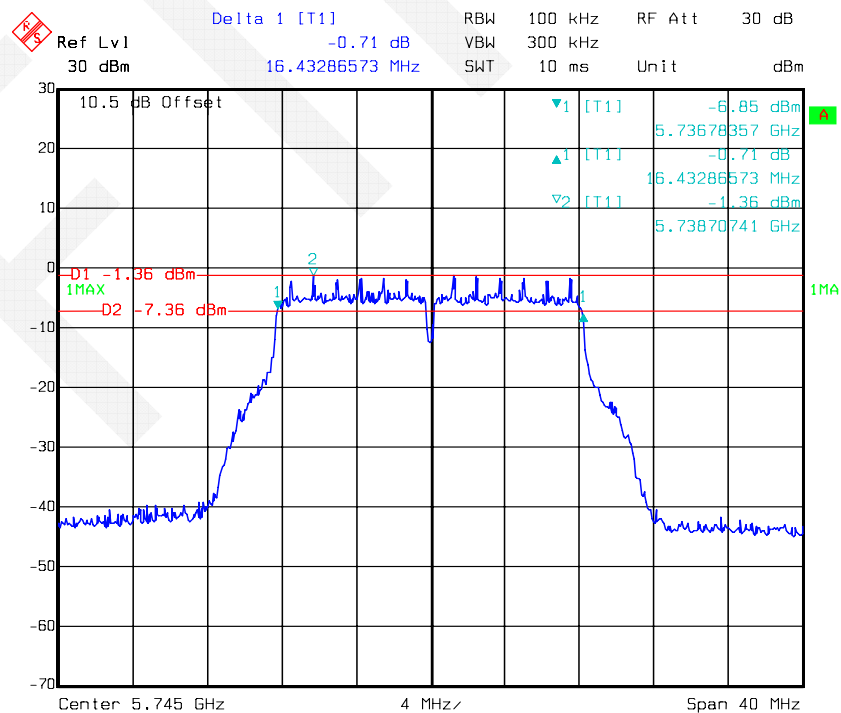
Date: 26.SEP.2017 13:21:57

802.11a mode, 6 dB Bandwidth-5825 MHz, Antenna 0



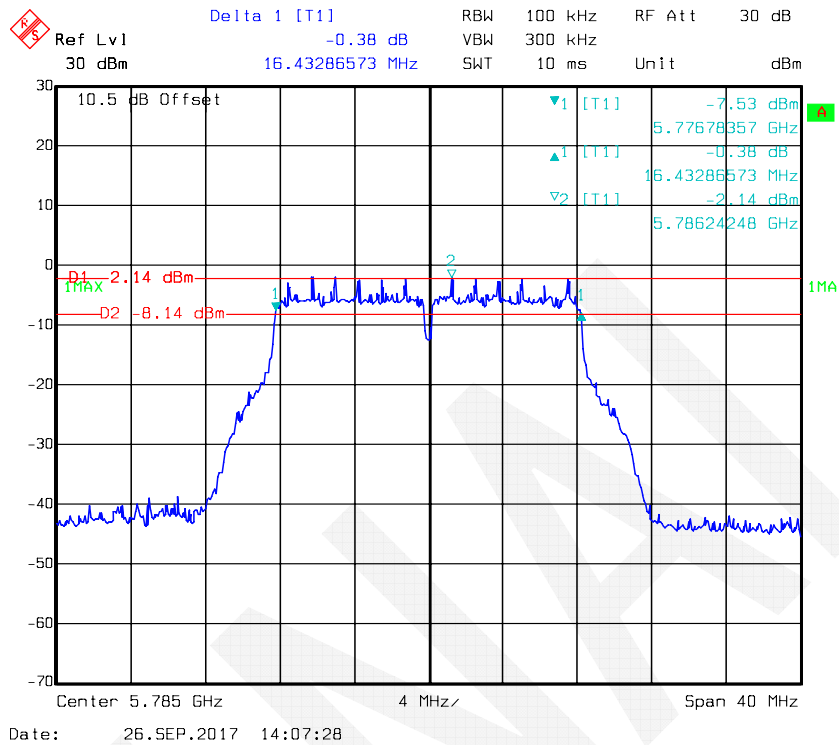
Date: 26.SEP.2017 13:23:44

802.11a mode, 6 dB Bandwidth-5745 MHz, Antenna 1

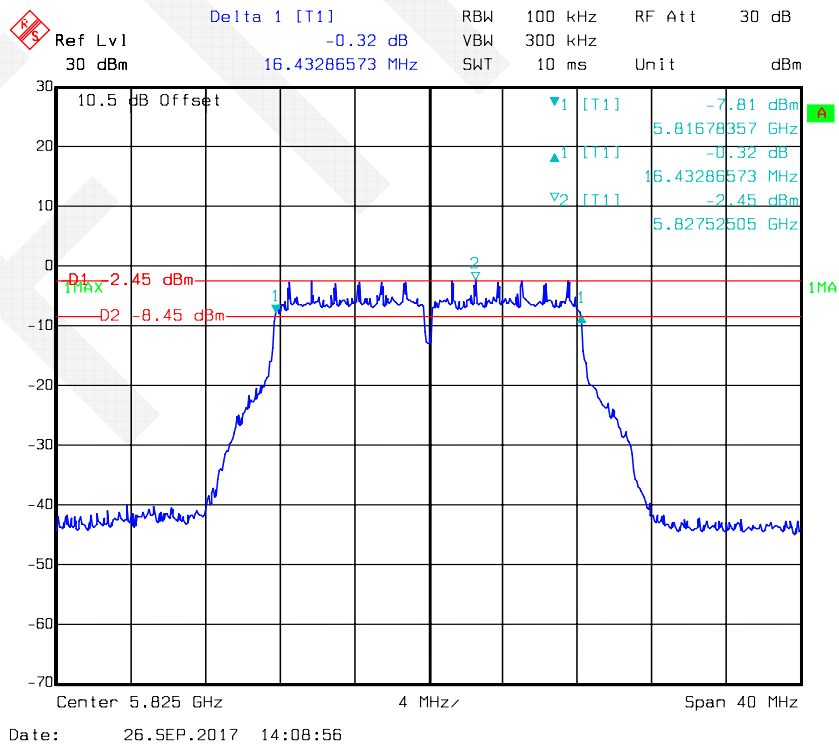


Date: 26.SEP.2017 14:05:32

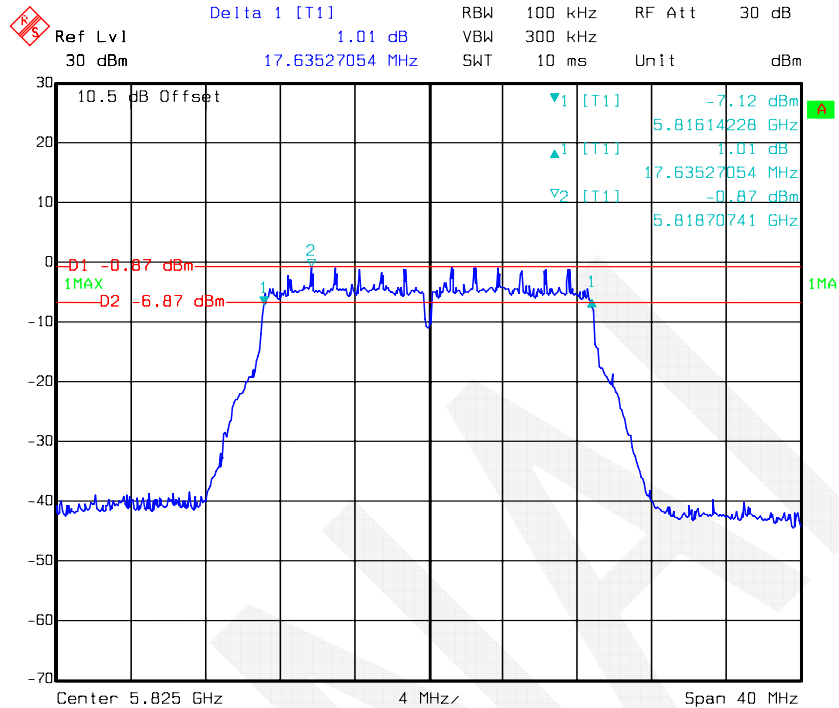
802.11a mode, 6 dB Bandwidth-5785 MHz, Antenna 1



802.11a mode, 6 dB Bandwidth-5825 MHz, Antenna 1

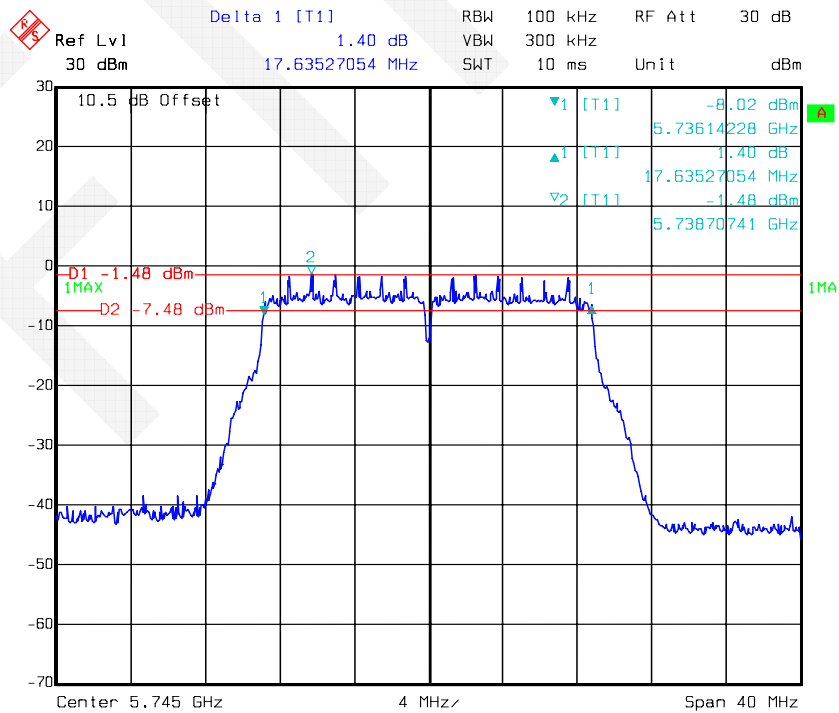


802.11n-HT20 mode, 6 dB Bandwidth-5825 MHz, Antenna 0



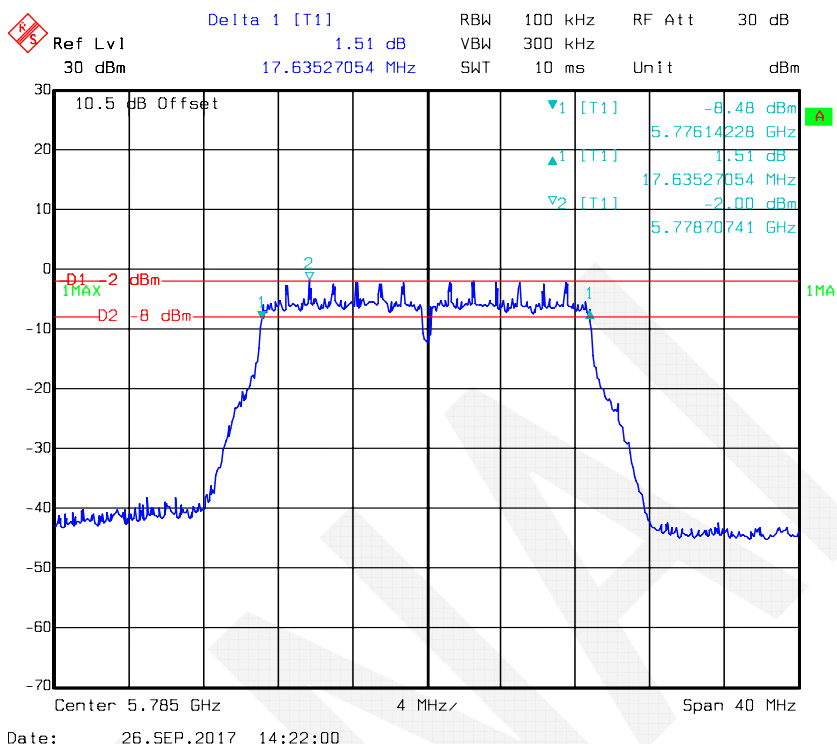
Date: 26.SEP.2017 13:33:25

802.11n-HT20 mode, 6 dB Bandwidth-5745 MHz, Antenna 1

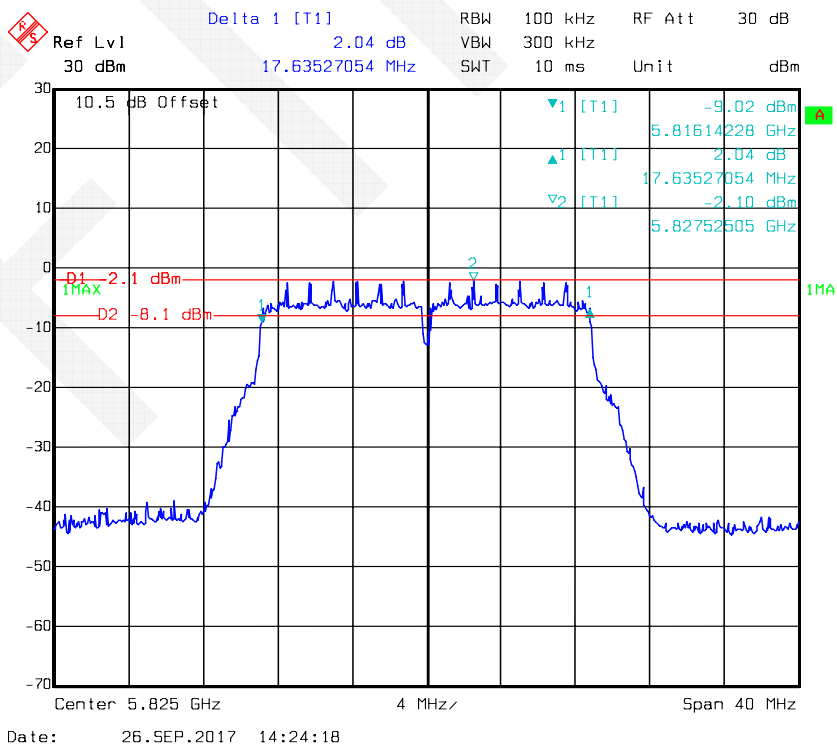


Date: 26.SEP.2017 14:16:52

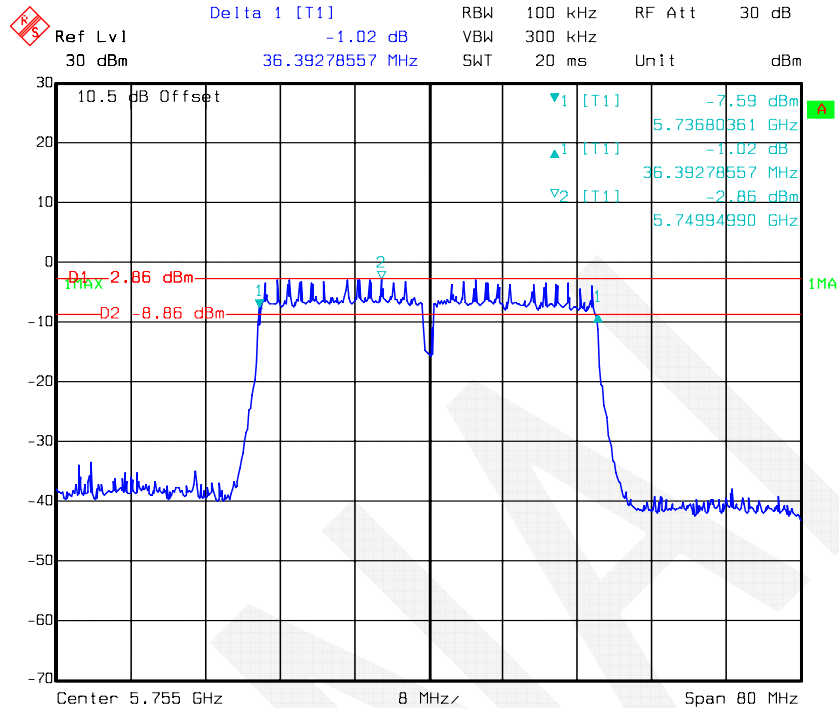
802.11n-HT20 mode, 6 dB Bandwidth-5785 MHz, Antenna 1



802.11n-HT20 mode, 6 dB Bandwidth-5825 MHz, Antenna 1

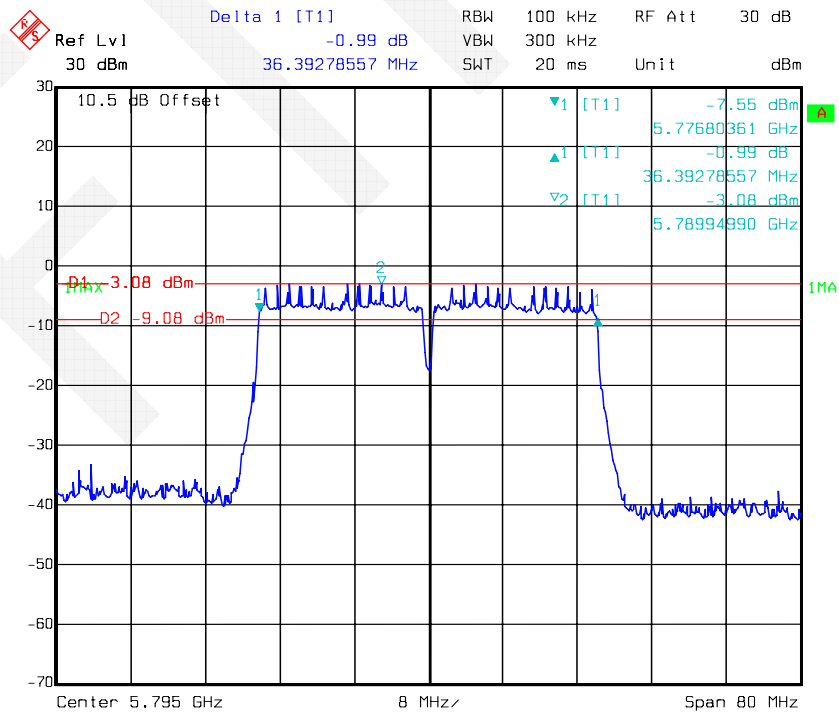


802.11n-HT40 mode, 6 dB Bandwidth-5755 MHz, Antenna 0



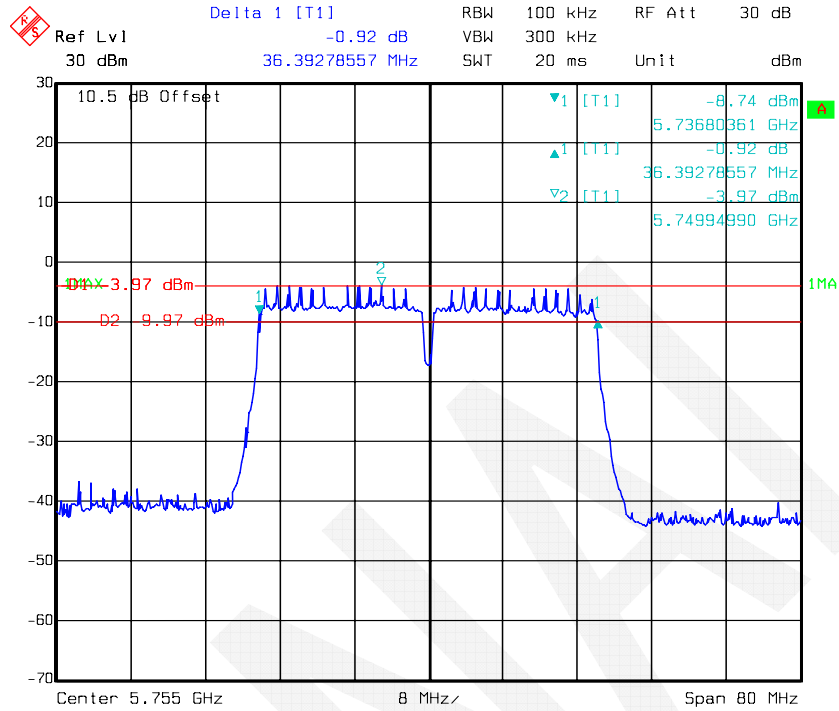
Date: 26.SEP.2017 13:38:51

802.11n-HT40 mode, 6 dB Bandwidth-5795 MHz, Antenna 0



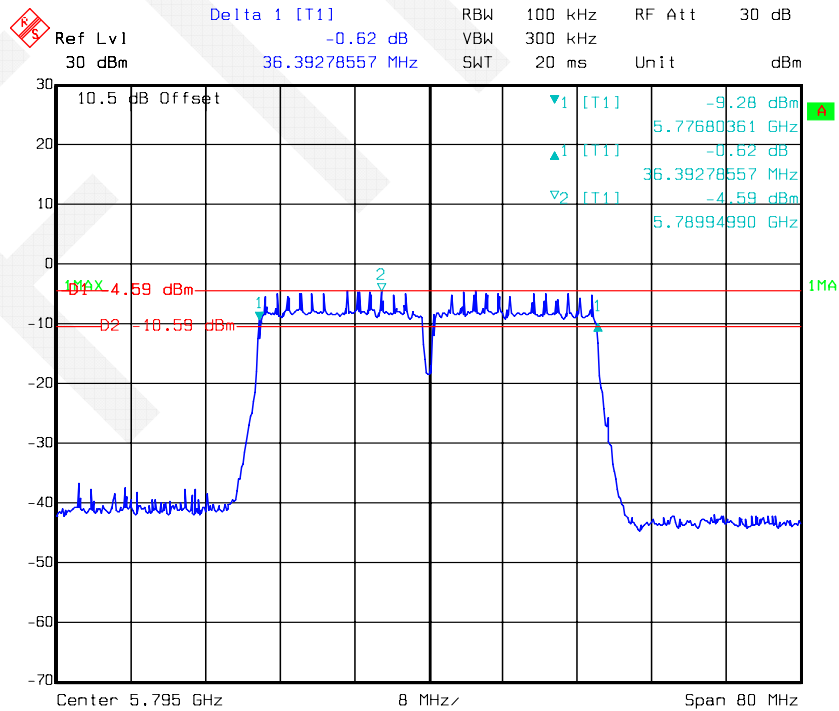
Date: 26.SEP.2017 13:40:21

802.11n-HT40 mode, 6 dB Bandwidth-5755 MHz, Antenna 1



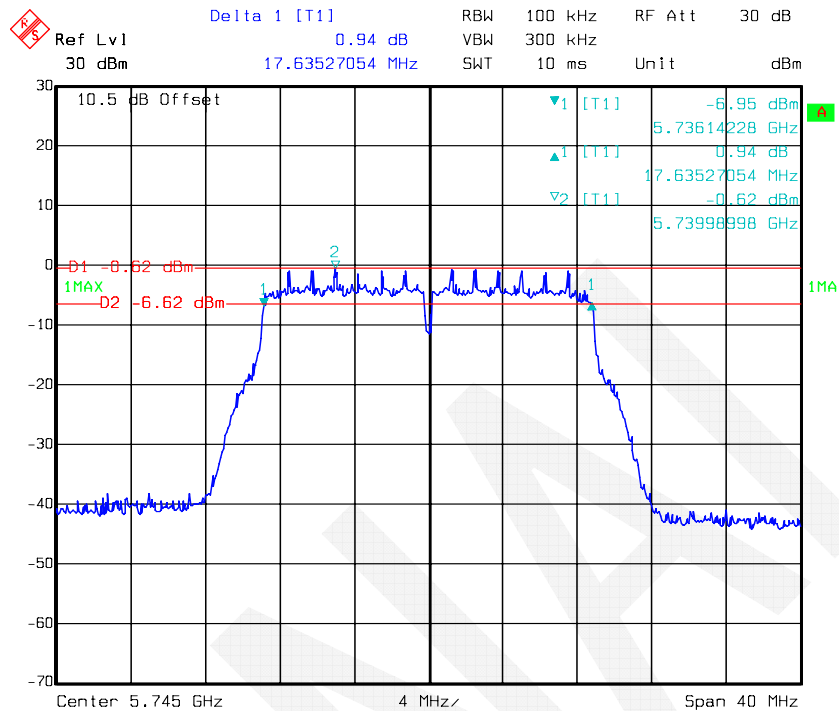
Date: 26.SEP.2017 14:00:49

802.11n-HT40 mode, 6 dB Bandwidth-5795 MHz, Antenna 1



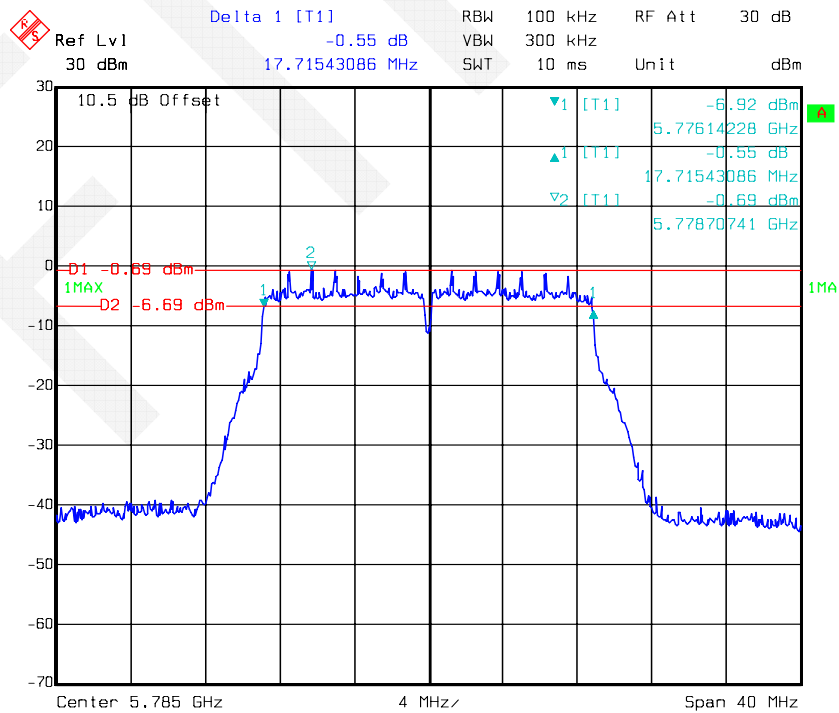
Date: 26.SEP.2017 14:03:12

802.11ac20 mode, 6 dB Bandwidth-5745 MHz, Antenna 0



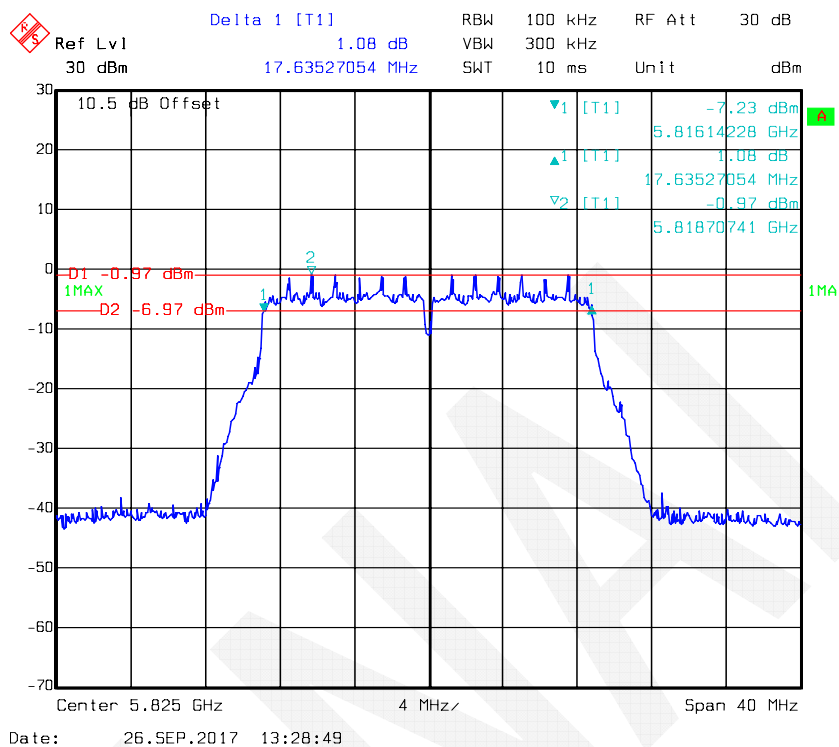
Date: 26.SEP.2017 13:25:40

802.11ac20 mode, 6 dB Bandwidth-5785 MHz, Antenna 0

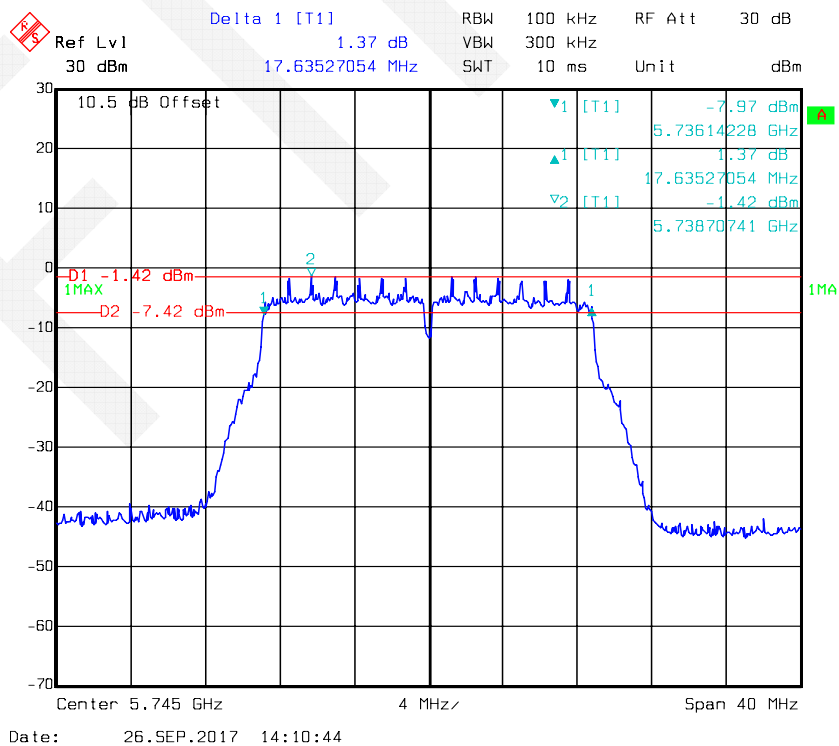


Date: 26.SEP.2017 13:27:17

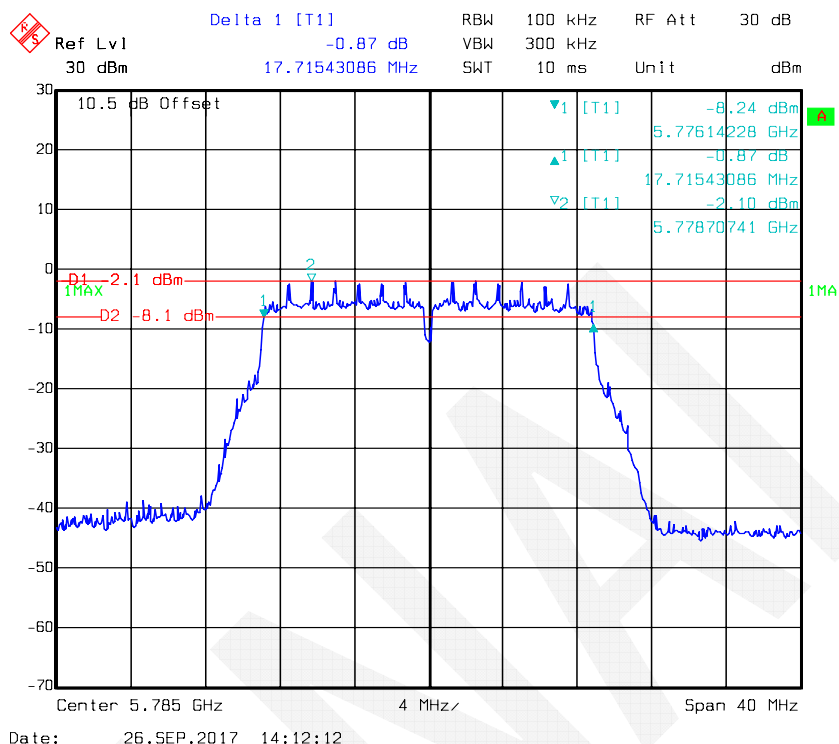
802.11ac20 mode, 6 dB Bandwidth-5825 MHz, Antenna 0



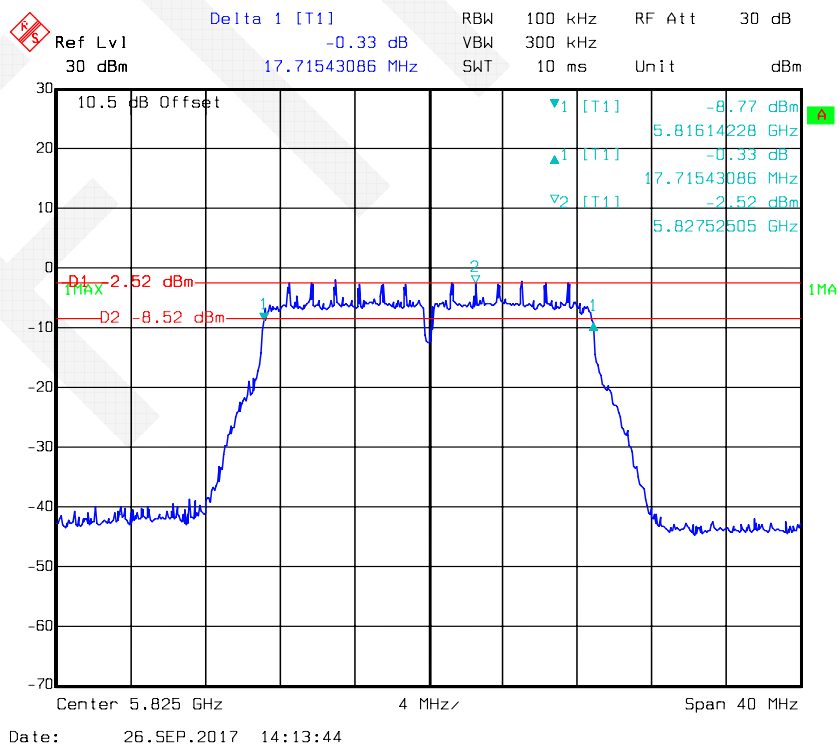
802.11ac20 mode, 6 dB Bandwidth-5745 MHz, Antenna 1



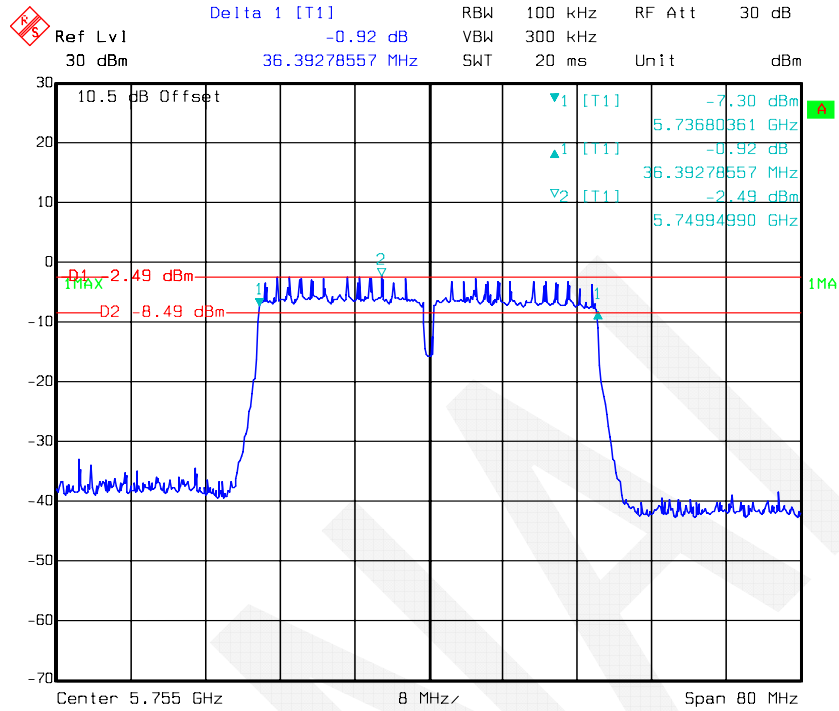
802.11ac20 mode, 6 dB Bandwidth-5785 MHz, Antenna 1



802.11ac20 mode, 6 dB Bandwidth-5825 MHz, Antenna 1

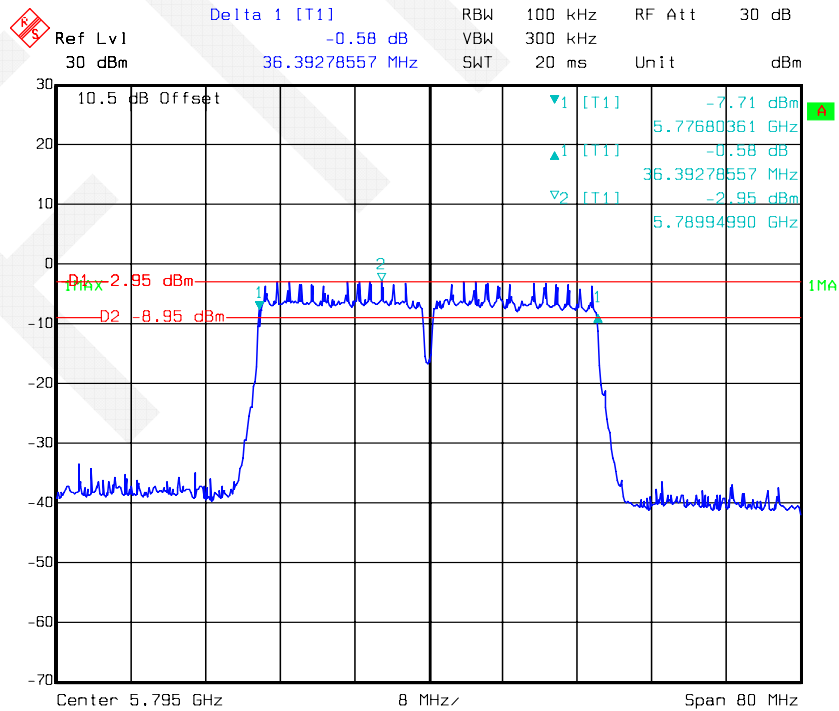


802.11ac40 mode, 6 dB Bandwidth-5755 MHz, Antenna 0



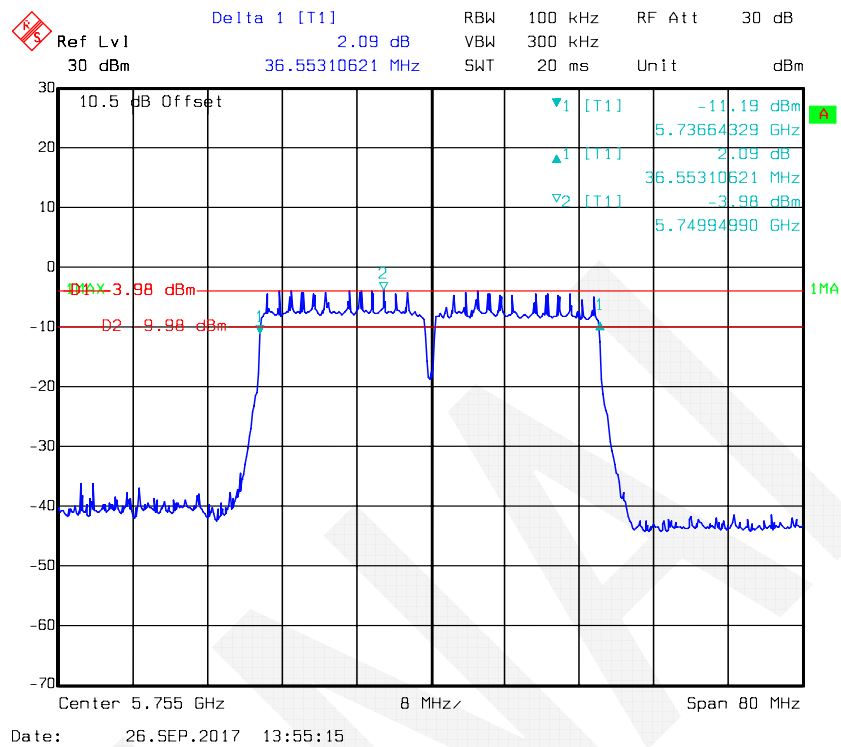
Date: 26.SEP.2017 14:32:10

802.11ac40 mode, 6 dB Bandwidth-5795 MHz, Antenna 0

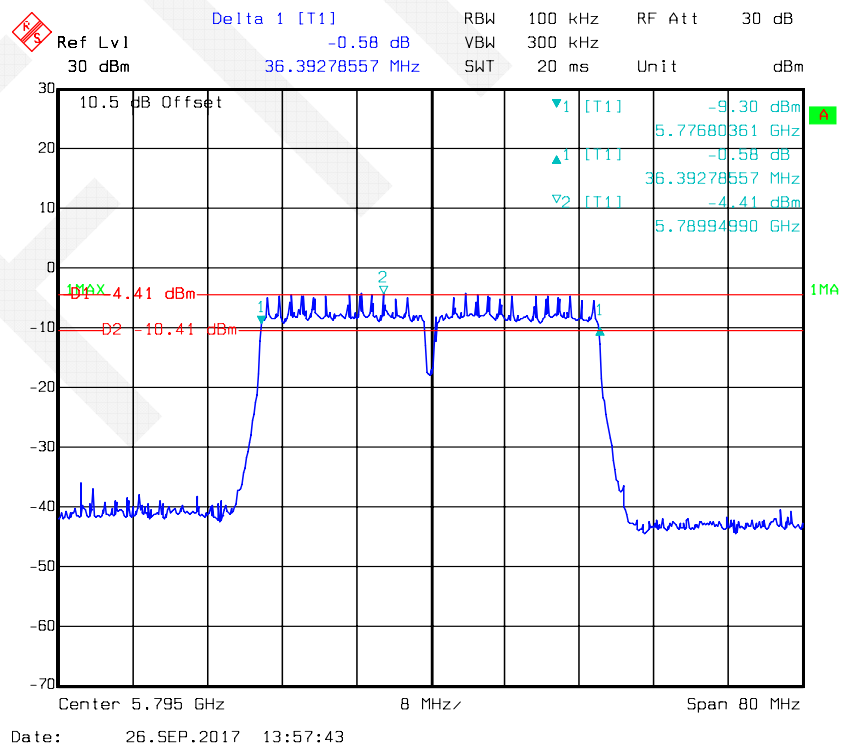


Date: 26.SEP.2017 14:34:03

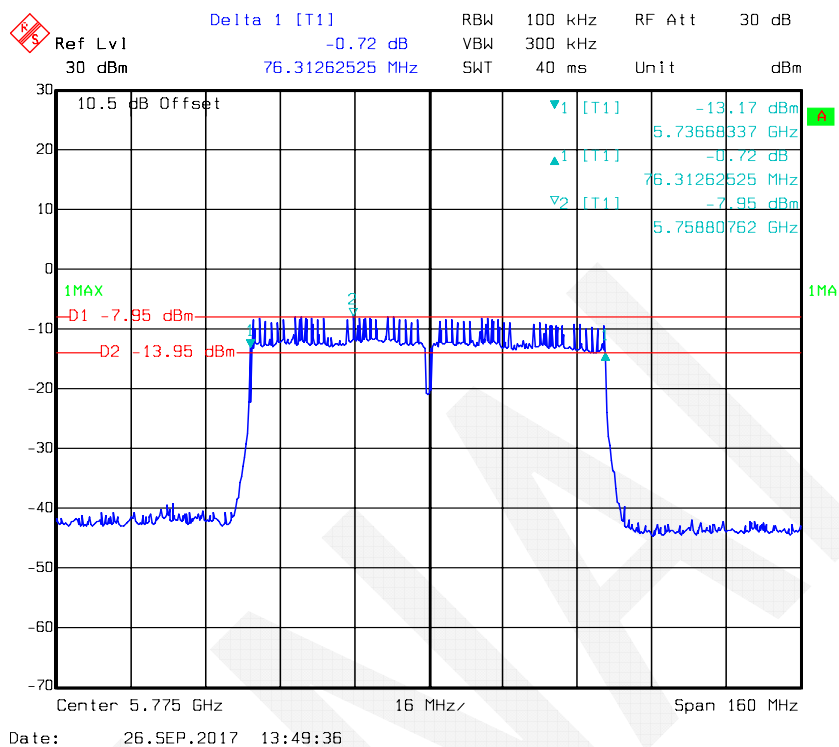
802.11ac40 mode, 6 dB Bandwidth-5755 MHz, Antenna 1



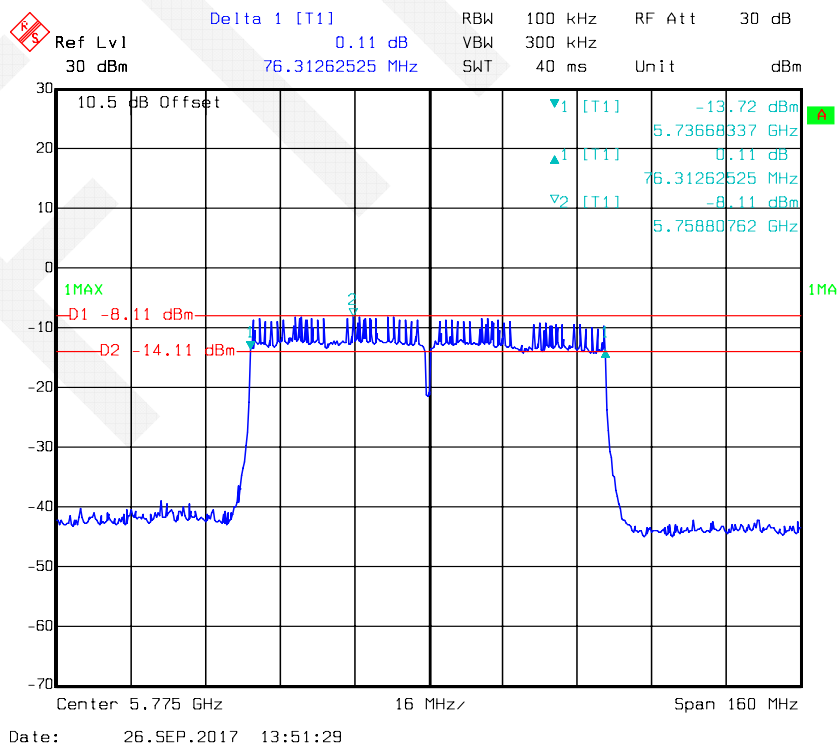
802.11ac40 mode, 6 dB Bandwidth-5795 MHz, Antenna 1



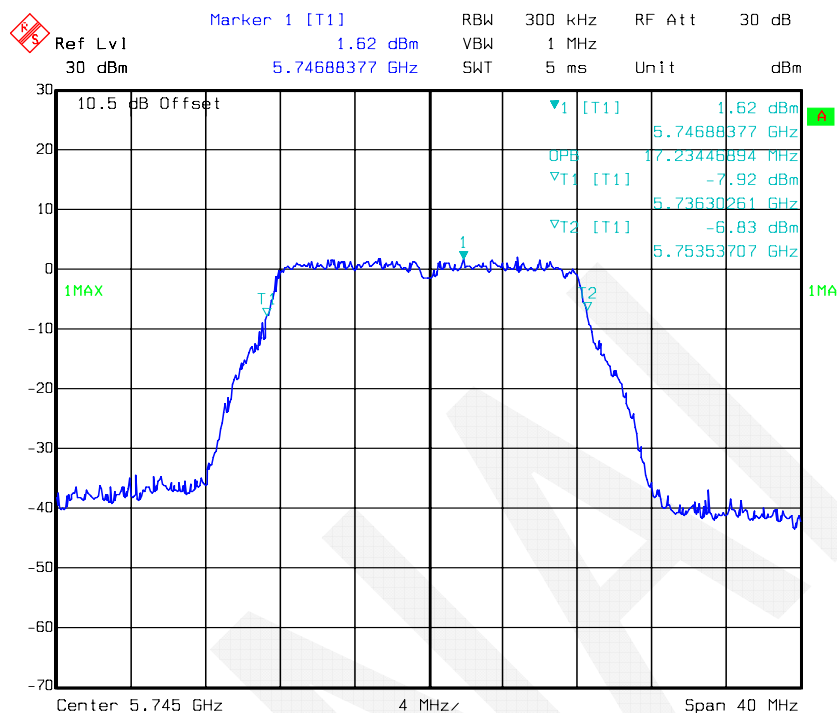
802.11ac80 mode, 6 dB Bandwidth-5775 MHz, Antenna 0



802.11ac80 mode, 6 dB Bandwidth-5775 MHz, Antenna 1

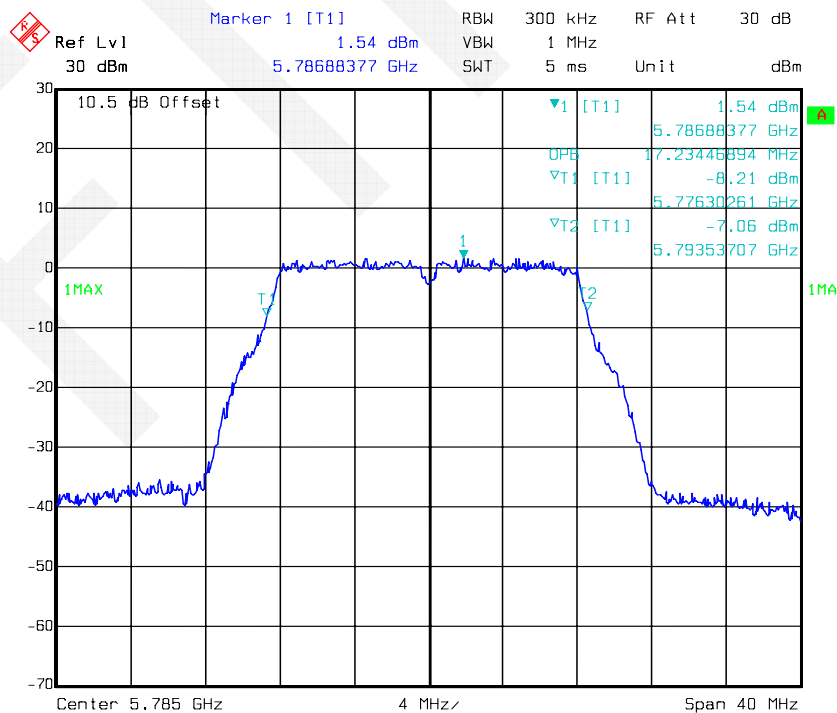


802.11a mode, 99% Occupied Bandwidth-5745 MHz, Antenna 0



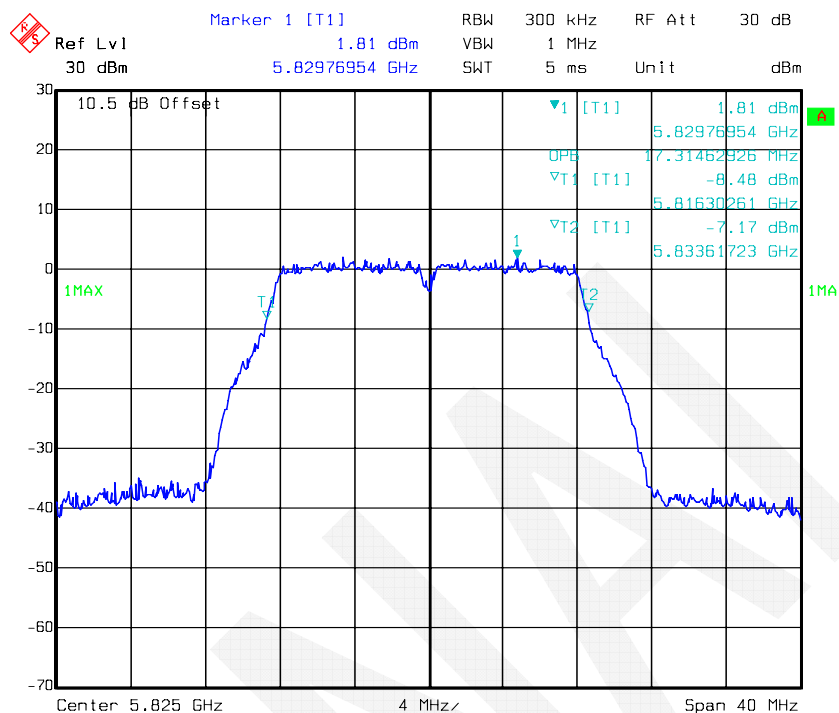
Date: 26.SEP.2017 13:17:21

802.11a mode, 99% Occupied Bandwidth -5785 MHz, Antenna 0

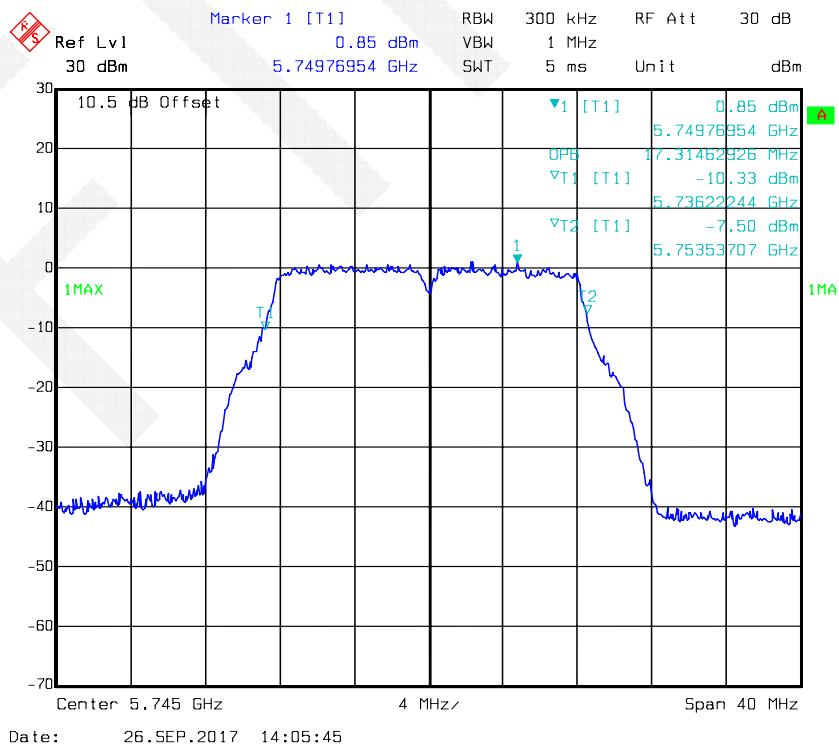


Date: 26.SEP.2017 13:22:06

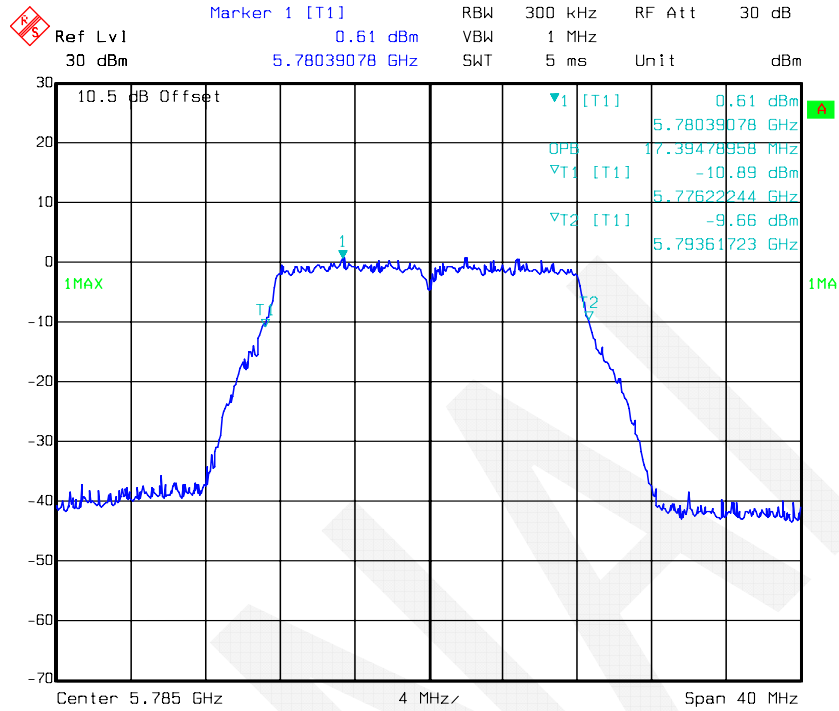
802.11a mode, 99% Occupied Bandwidth -5825 MHz, Antenna 0



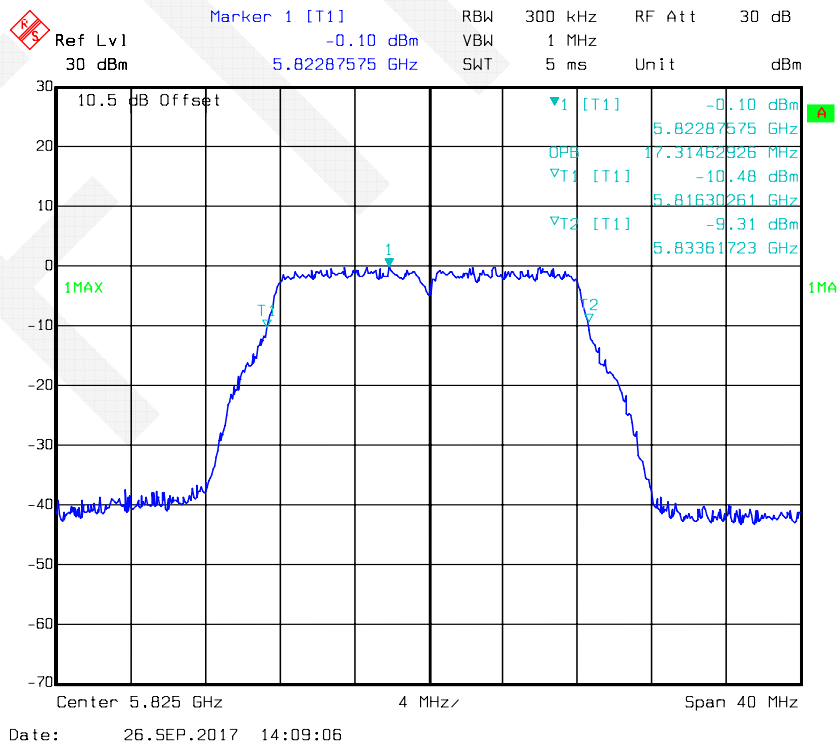
802.11a mode, 99% Occupied Bandwidth-5745 MHz, Antenna 1



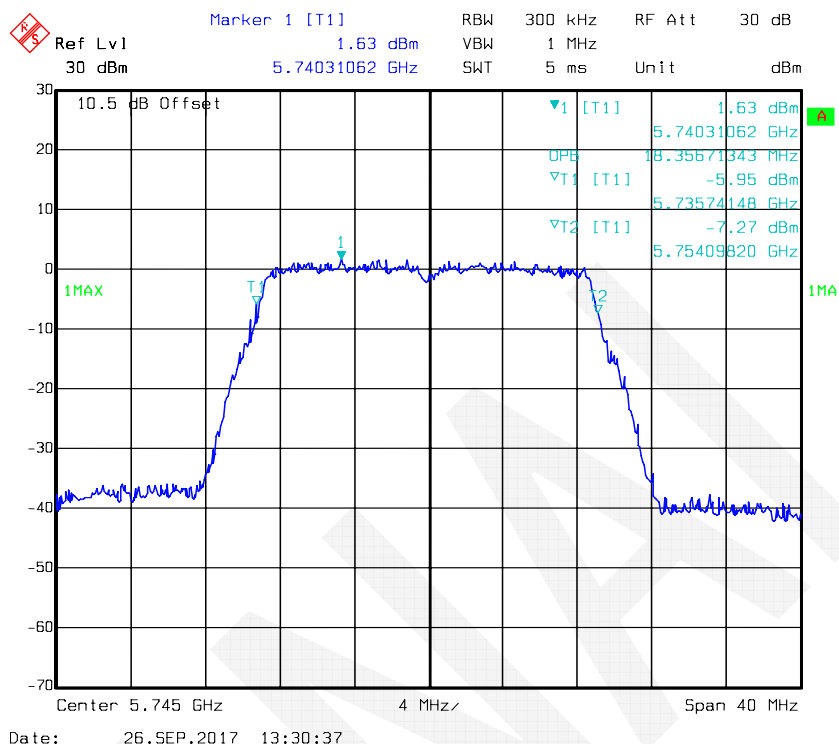
802.11a mode, 99% Occupied Bandwidth -5785 MHz, Antenna 1



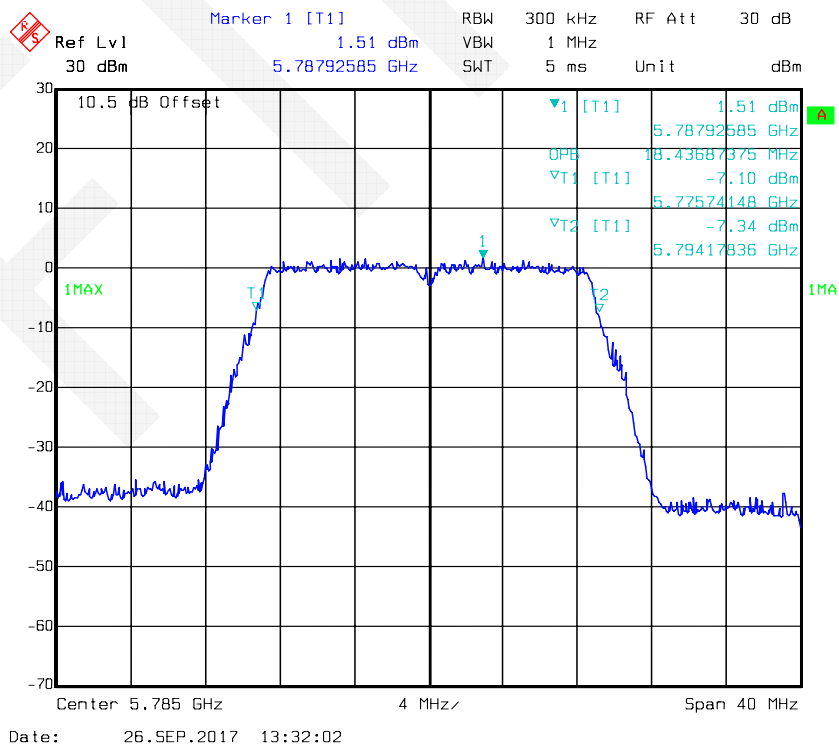
802.11a mode, 99% Occupied Bandwidth -5825 MHz, Antenna 1



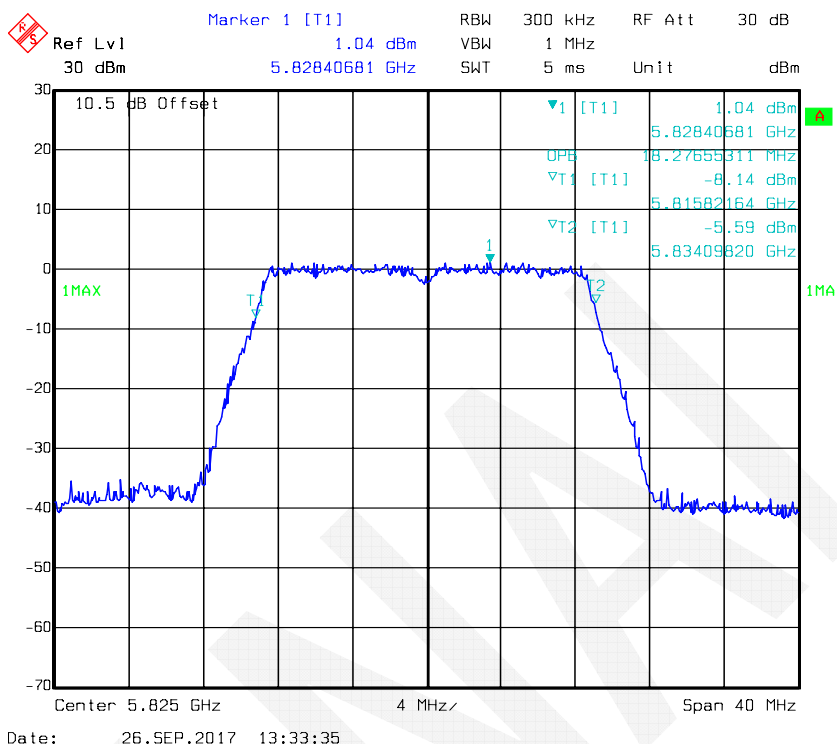
802.11n-HT20 mode, 99% Occupied Bandwidth-5745 MHz, Antenna 0



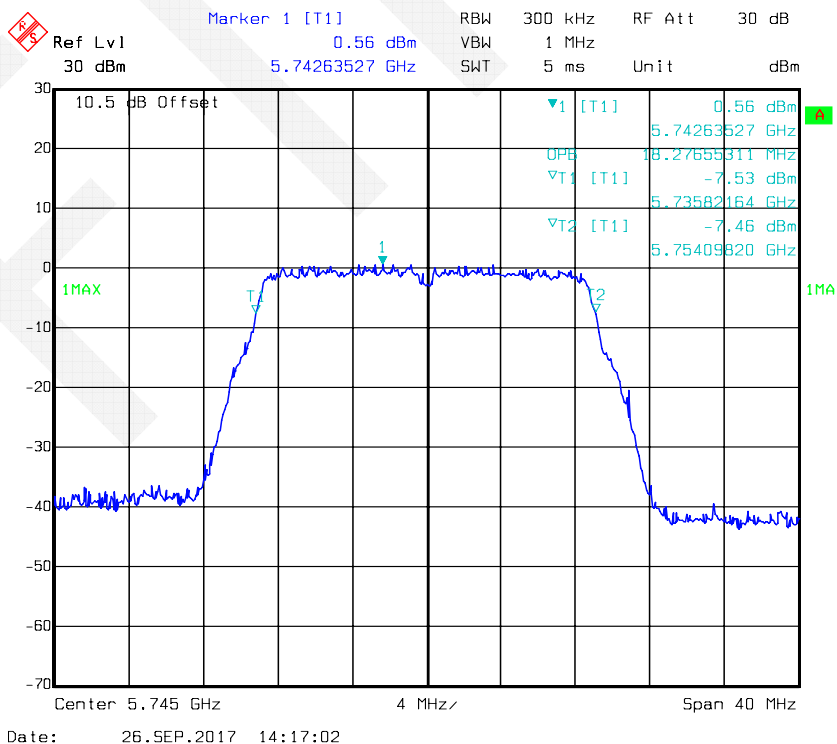
802.11n-HT20 mode, 99% Occupied Bandwidth-5785 MHz, Antenna 0



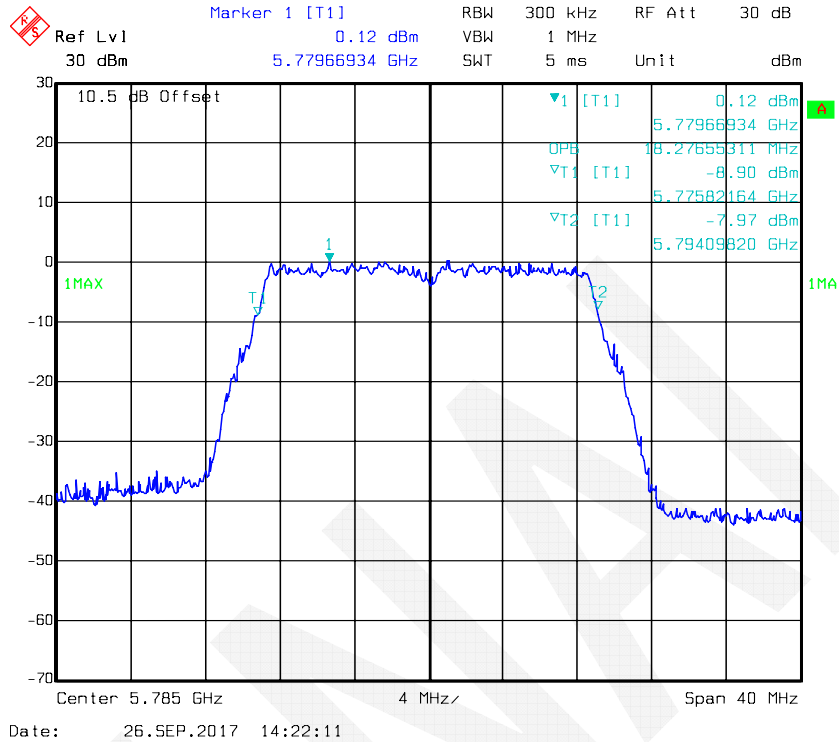
802.11n-HT20 mode, 99% Occupied Bandwidth-5825 MHz, Antenna 0



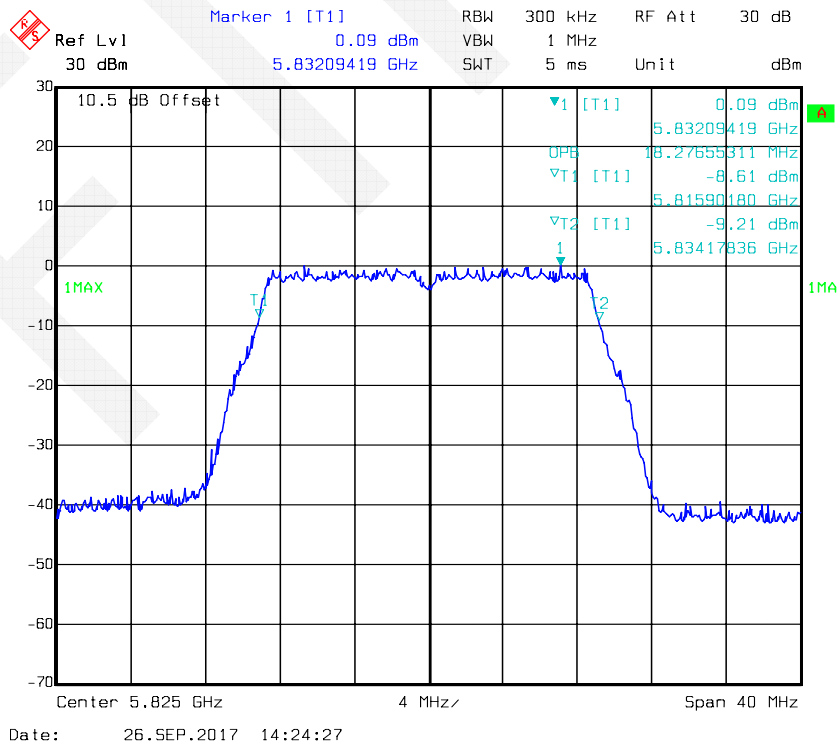
802.11n-HT20 mode, 99% Occupied Bandwidth-5745 MHz, Antenna 1



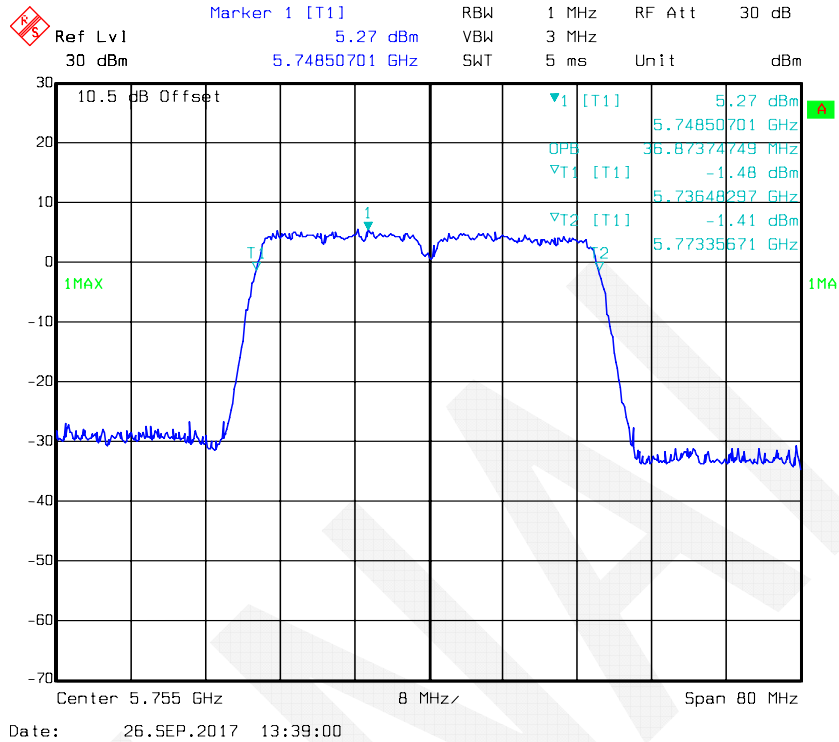
802.11n-HT20 mode, 99% Occupied Bandwidth-5785 MHz, Antenna 1



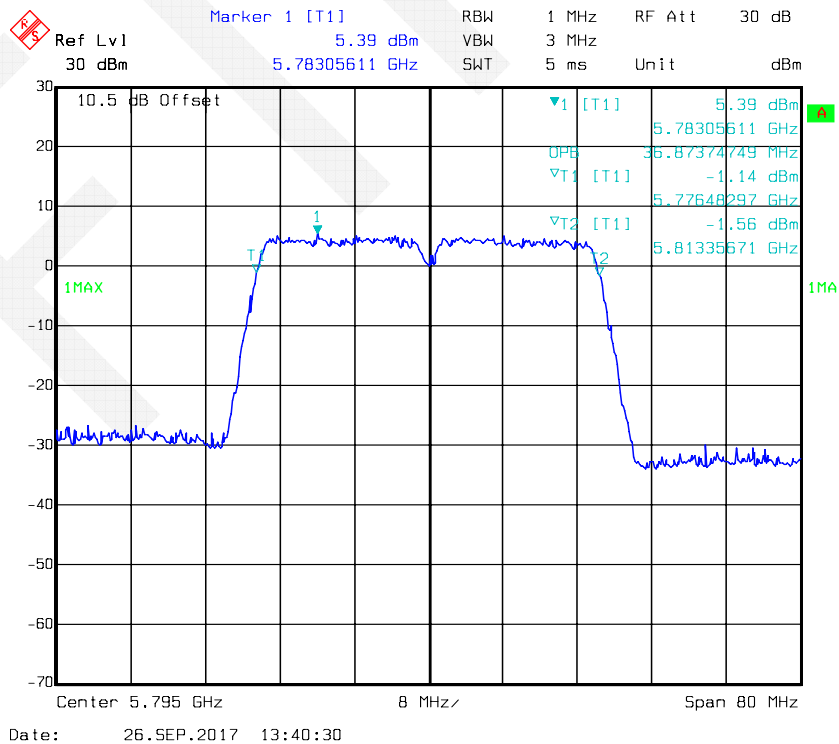
802.11n-HT20 mode, 99% Occupied Bandwidth-5825 MHz, Antenna 1



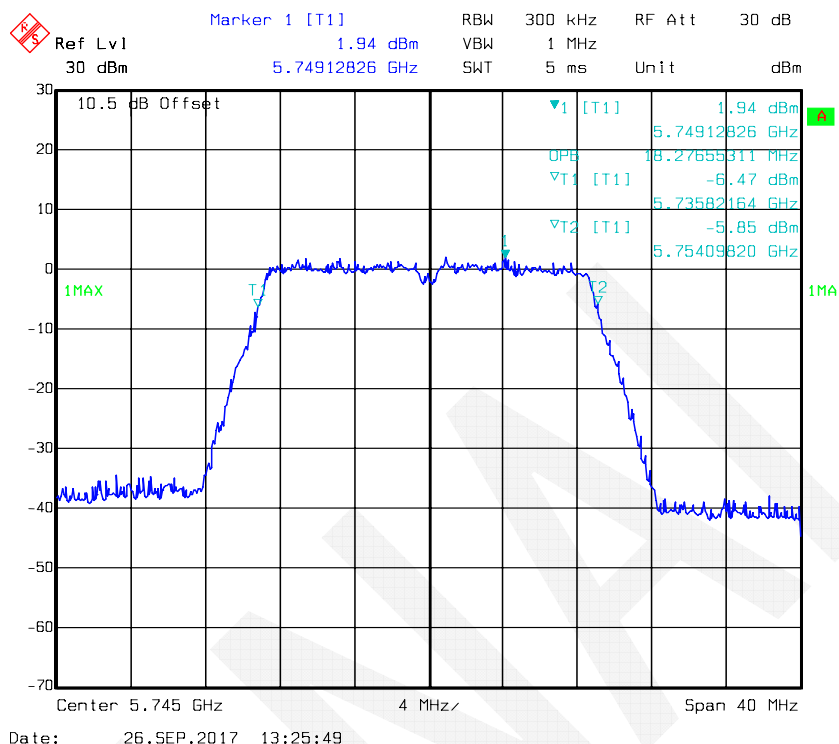
802.11n-HT40 mode, 99% Occupied Bandwidth-5755 MHz, Antenna 0



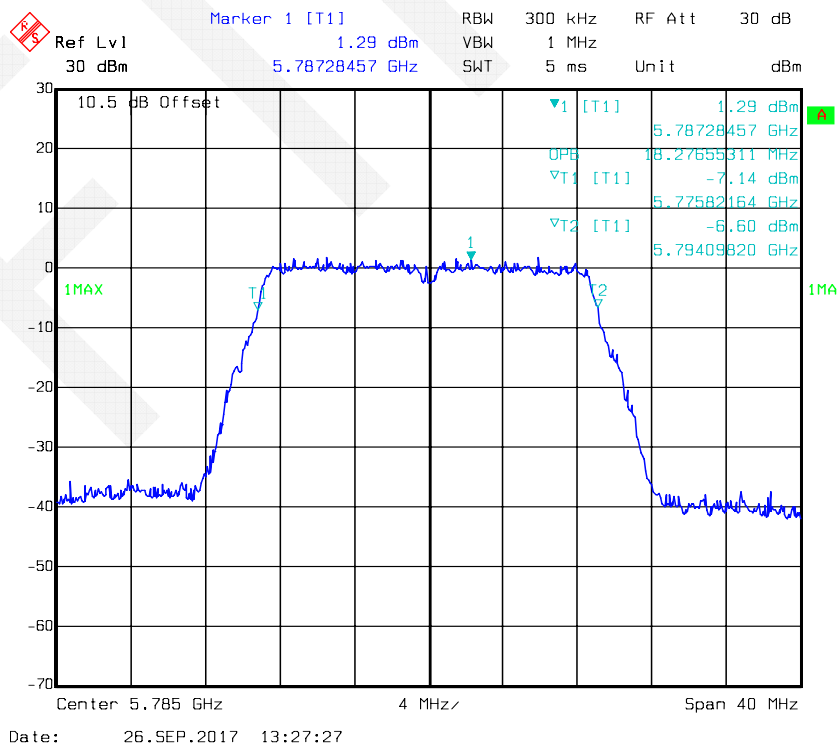
802.11n-HT40 mode, 99% Occupied Bandwidth-5795 MHz, Antenna 0



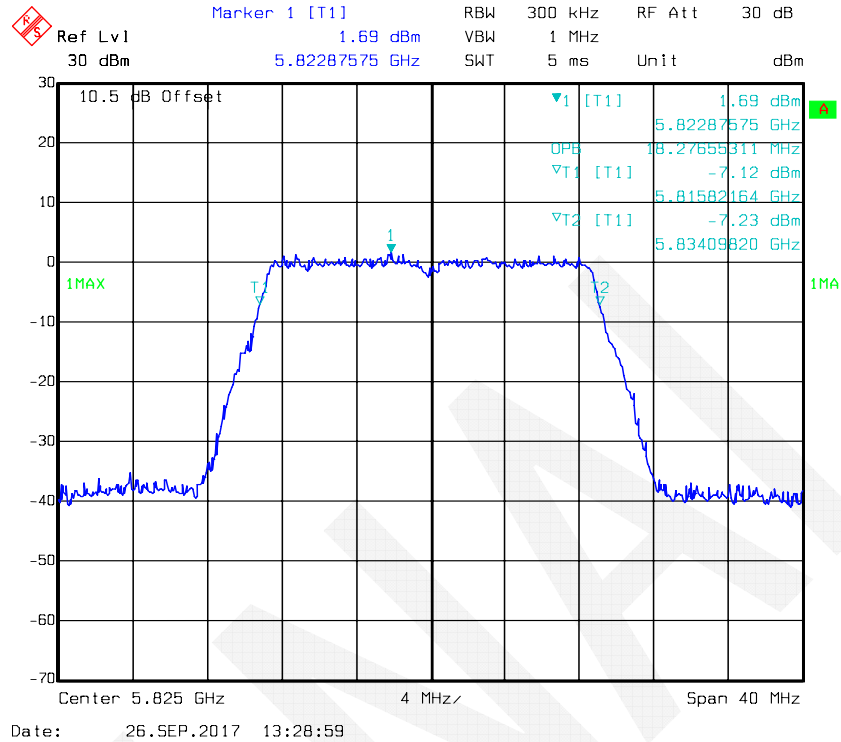
802.11ac20 mode, 99% Occupied Bandwidth-5745 MHz, Antenna 0



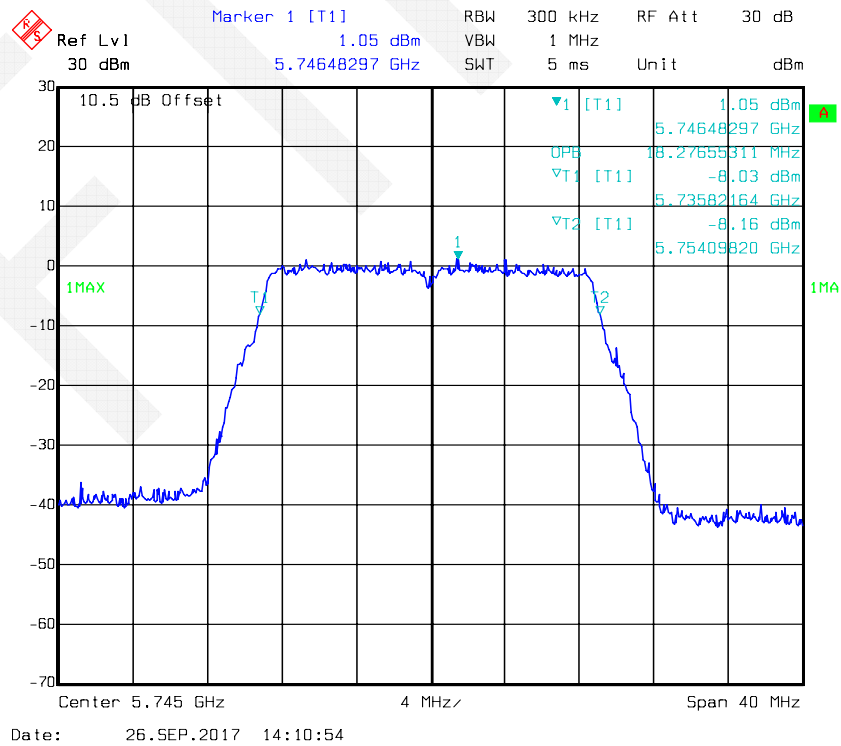
802.11ac20 mode, 99% Occupied Bandwidth-5785 MHz, Antenna 0



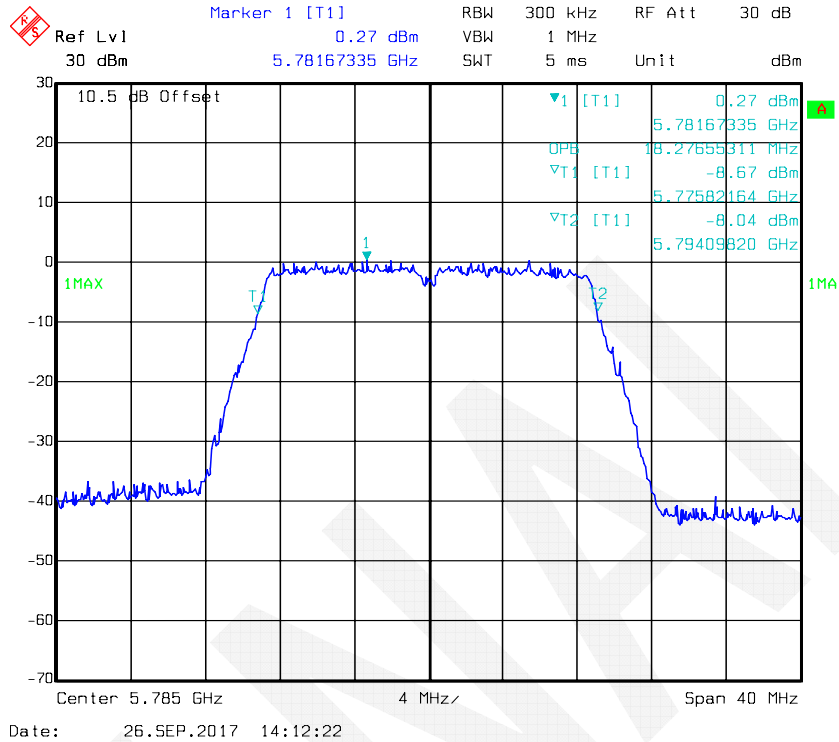
802.11ac20 mode, 99% Occupied Bandwidth-5825 MHz, Antenna 0



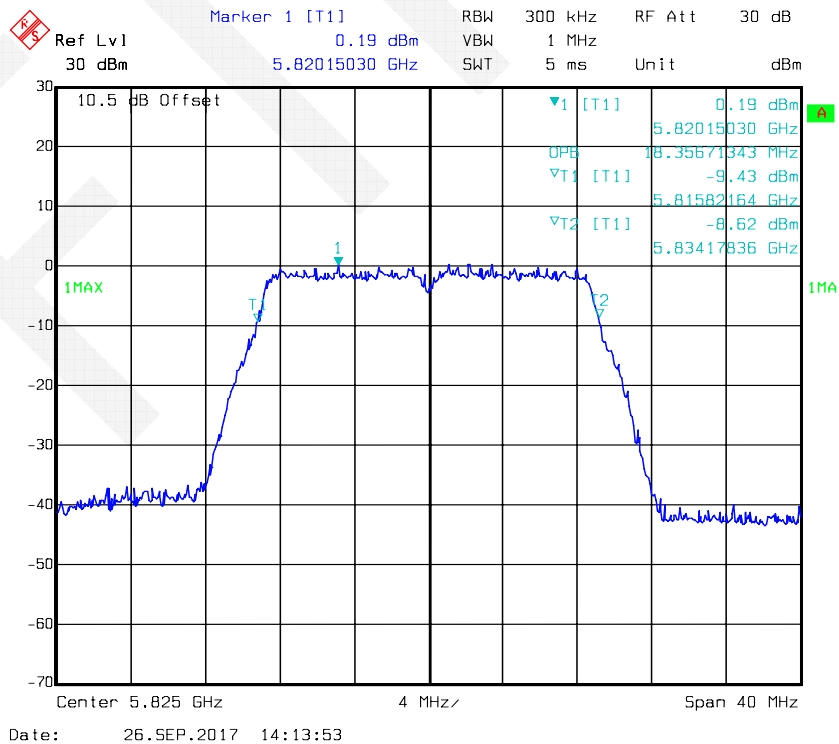
802.11ac20 mode, 99% Occupied Bandwidth-5745 MHz, Antenna 1



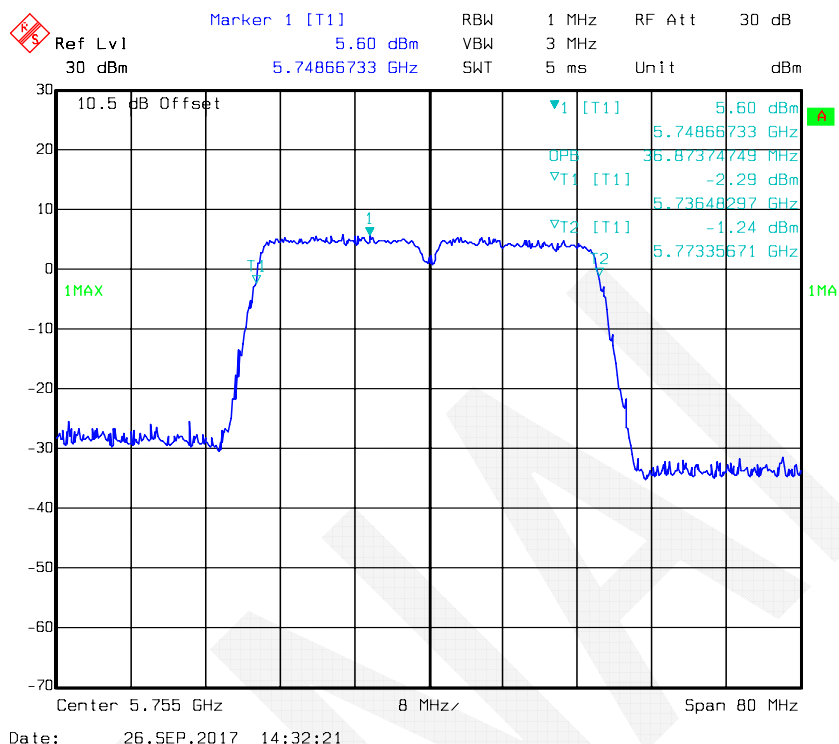
802.11ac20 mode, 99% Occupied Bandwidth-5785 MHz, Antenna 1



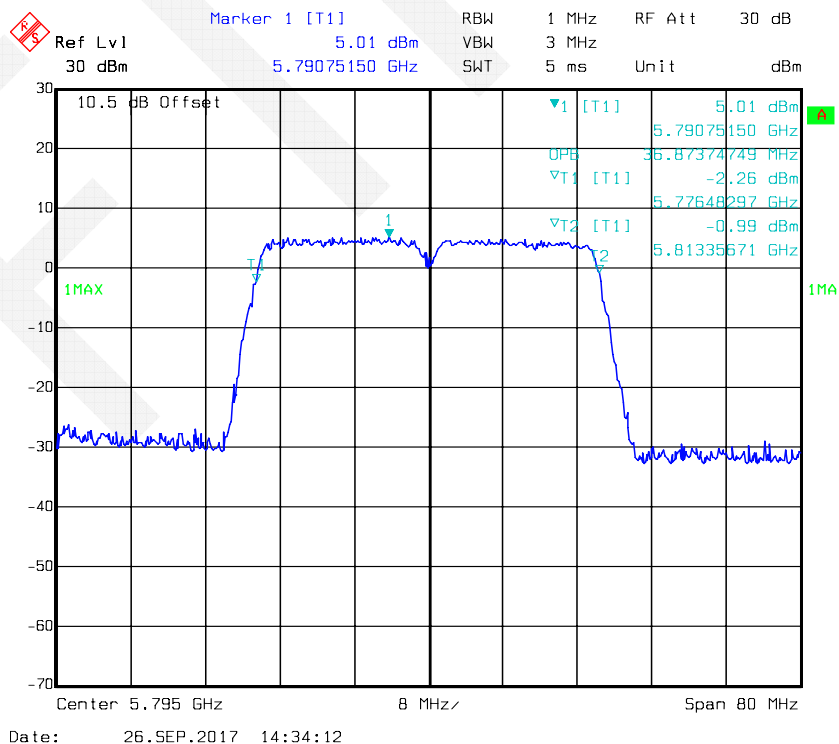
802.11ac20 mode, 99% Occupied Bandwidth-5825 MHz, Antenna 1



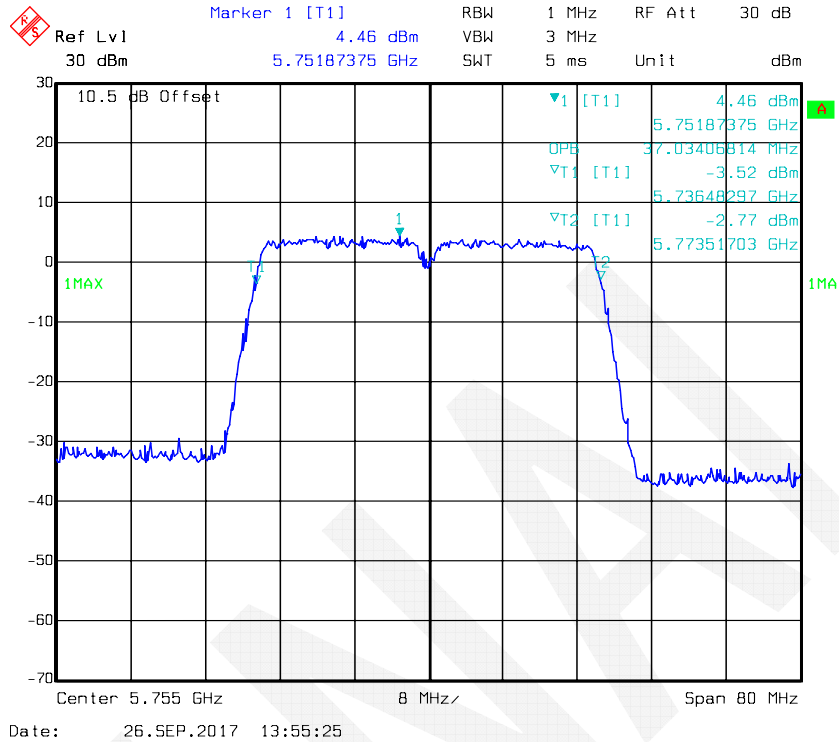
802.11ac40 mode, 99% Occupied Bandwidth-5755 MHz, Antenna 0



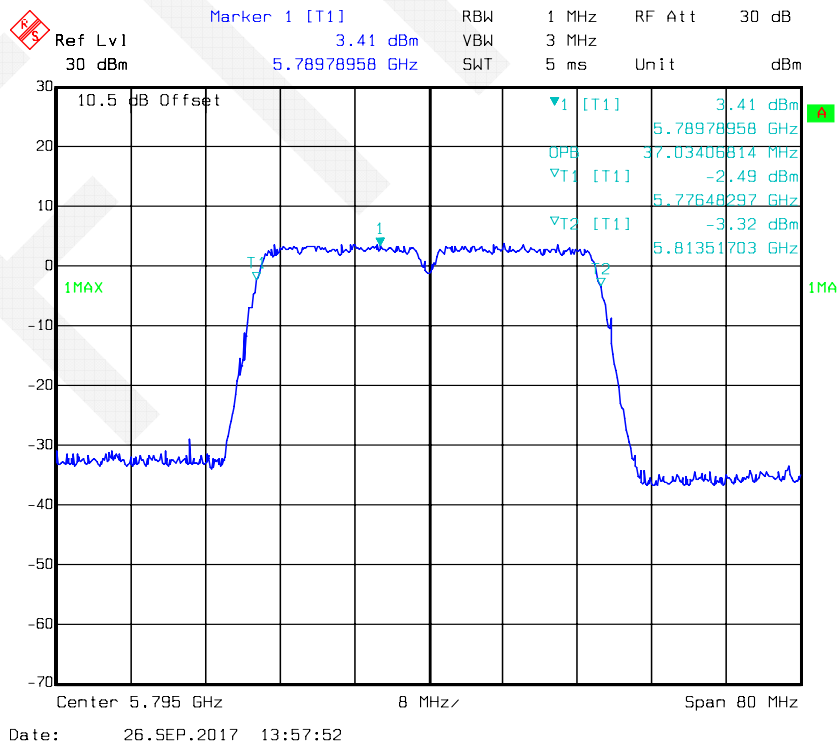
802.11ac40 mode, 99% Occupied Bandwidth-5795 MHz, Antenna 0



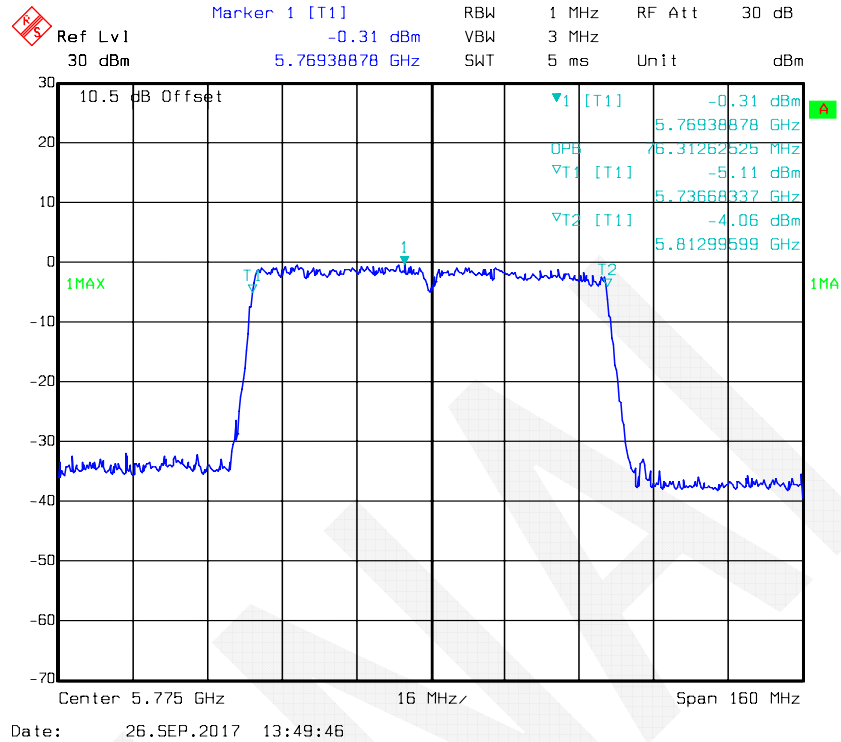
802.11ac40 mode, 99% Occupied Bandwidth-5755 MHz, Antenna 1



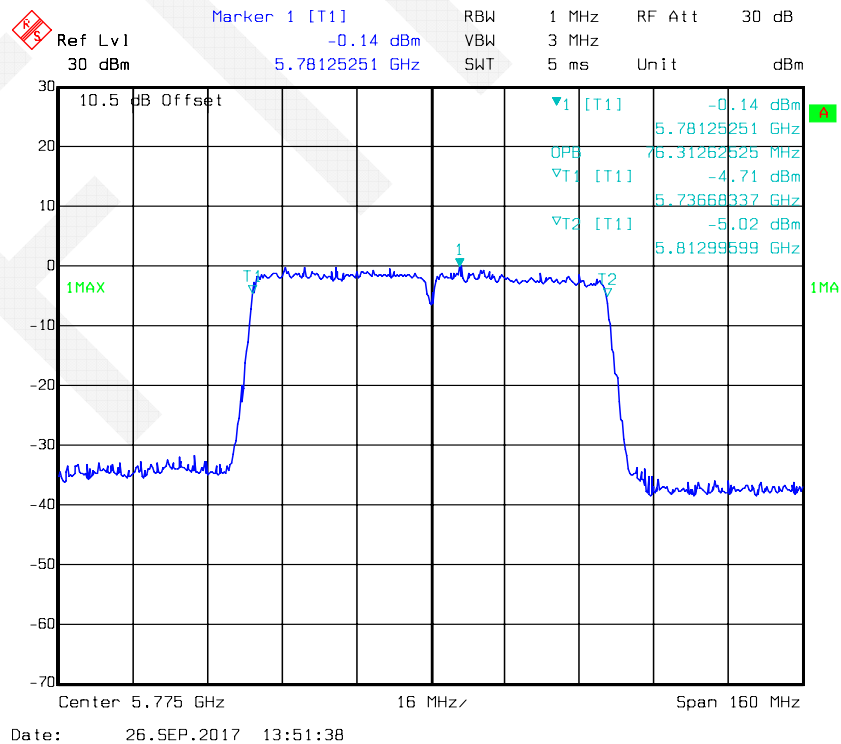
802.11ac40 mode, 99% Occupied Bandwidth-5795 MHz, Antenna 1



802.11ac80 mode, 99% Occupied Bandwidth-5775 MHz, Antenna 0



802.11ac80 mode, 99% Occupied Bandwidth-5775 MHz, Antenna 1



FCC §15.407(g) – FREQUENCY STABILITY

Applicable Standard

FCC §15.407(g)

(g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Test Procedure

According to ANSI C63.10-2013 “American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices”.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	95.2 kPa

The testing was performed by Tom Tang on 2017-09-26.

Test Mode: Transmitting (Test was performed at Antenna 1)

Test Result: Compliant

For 5150-5250 MHz:

802.11a				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5171.3016	5248.6149	FL and FH Within 5150~5250MHz range
10		5171.3022	5248.6168	
20		5171.3026	5248.6172	
30		5171.3031	5248.6185	
40		5171.3033	5248.6195	
25	9.26	5171.3040	5248.6209	
25	12.52	5171.3043	5248.6216	

802.11n-HT20				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5170.8211	5249.1763	FL and FH Within 5150~5250MHz range
10		5170.8221	5249.1777	
20		5170.8216	5249.1784	
30		5170.8221	5249.1793	
40		5170.8230	5249.1794	
25	9.26	5170.8235	5249.1801	
25	12.52	5170.8246	5249.1803	

802.11n40				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5171.6431	5248.5148	FL and FH Within 5150~5250MHz range
10		5171.6440	5248.5178	
20		5171.6433	5248.5170	
30		5171.6446	5248.5183	
40		5171.6457	5248.5185	
25	9.26	5171.6462	5248.5190	
25	12.52	5171.6472	5248.5195	

802.11ac20				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5170.8200	5249.1754	FL and FH Within 5150~5250MHz range
10		5170.8207	5249.1781	
20		5170.8216	5249.1784	
30		5170.8216	5249.1790	
40		5170.8220	5249.1791	
25	9.26	5170.8231	5249.1802	
25	12.52	5170.8234	5249.1816	

802.11ac40				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
℃	Vdc	MHz	MHz	
0	10.89	5171.6427	5248.5169	FL and FH Within 5150~5250MHz range
10		5171.6414	5248.5154	
20		5171.6432	5248.5170	
30		5171.6433	5248.5184	
40		5171.6437	5248.5184	
25	9.26	5171.6442	5248.5188	
25	12.52	5171.6443	5248.5191	

802.11ac80				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
℃	Vdc	MHz	MHz	
0	10.89	5172.0020	5248.3142	FL and FH Within 5150~5250MHz range
10		5172.0032	5248.3148	
20		5172.0040	5248.3166	
30		5172.0043	5248.3174	
40		5172.0056	5248.3175	
25	9.26	5172.0065	5248.3183	
25	12.52	5172.0074	5248.3193	

For 5725-5850 MHz:

802.11a				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
℃	Vdc	MHz	MHz	
0	10.89	5736.3014	5833.6164	FL and FH Within 5725~5850MHz range
10		5736.3023	5833.6154	
20		5736.3026	5833.6172	
30		5736.3032	5833.6174	
40		5736.3046	5833.6181	
25	9.26	5736.3047	5833.6193	
25	12.52	5736.3050	5833.6198	

802.11n-HT20				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5735.7403	5834.0953	FL and FH Within 5725~5850MHz range
10		5735.7401	5834.0964	
20		5735.7415	5834.0982	
30		5735.7418	5834.0991	
40		5735.7425	5834.1004	
25	9.26	5735.7439	5834.1016	
25	12.52	5735.7448	5834.1026	

802.11n40				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5736.4826	5813.3541	FL and FH Within 5725~5850MHz range
10		5736.4823	5813.3566	
20		5736.4830	5813.3567	
30		5736.4841	5813.3580	
40		5736.4842	5813.3589	
25	9.26	5736.4854	5813.3589	
25	12.52	5736.4868	5813.3604	

802.11ac20				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
°C	Vdc	MHz	MHz	
0	10.89	5735.8200	5834.0981	FL and FH Within 5725~5850MHz range
10		5735.8207	5834.0965	
20		5735.8216	5834.0982	
30		5735.8220	5834.0991	
40		5735.8227	5834.0995	
25	9.26	5735.8238	5834.0998	
25	12.52	5735.8239	5834.1001	

802.11ac40				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
℃	Vdc	MHz	MHz	
0	10.89	5736.4820	5813.3559	FL and FH Within 5725~5850MHz range
10		5736.4815	5813.3540	
20		5736.4830	5813.3567	
30		5736.4834	5813.3569	
40		5736.4840	5813.3572	
25	9.26	5736.4842	5813.3585	
25	12.52	5736.4842	5813.3585	

802.11ac80				
Temperature	Voltage	FL at Low Test Channel	FH at High Test Channel	Limit
℃	Vdc	MHz	MHz	
0	10.89	5736.6824	5812.9947	FL and FH Within 5725~5850MHz range
10		5736.6815	5812.9956	
20		5736.6834	5812.9960	
30		5736.6835	5812.9968	
40		5736.6848	5812.9976	
25	9.26	5736.6861	5812.9982	
25	12.52	5736.6870	5812.9992	

FCC §15.407(a) (1)(IV), (3), (4) – CONDUCTED TRANSMITTER OUTPUT POWER

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

(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 colocated 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.

NOTE TO PARAGRAPH (A)(3): The Commission strongly recommends that parties employing U-NII devices to provide critical communications services should determine if there are any nearby Government radar systems that could affect their operation.

(4) The maximum conducted output power must be measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.

Test Procedure

(According to 789033 D02 General UNII Test Procedures New Rules v01r04)

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	95.2 kPa

The testing was performed by Tom Tang from 2016-09-26

Test Mode: Transmitting

For 5150-5250 MHz:

Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)		Total (dBm)	Limit (dBm)
			Antenna 0	Antenna 1		
802.11a	Low	5180	11.03	10.82	-	24
	Middle	5200	10.76	10.17	-	24
	High	5240	10.44	9.87	-	24
802.11n-HT20	Low	5180	11.11	11.42	14.28	24
	Middle	5200	10.87	11.09	13.99	24
	High	5240	10.59	10.86	13.74	24
802.11n-HT40	Low	5190	9.82	10.01	12.93	24
	High	5230	9.39	9.57	12.49	24
802.11ac20	Low	5180	11.07	10.98	14.04	24
	Middle	5200	10.73	10.42	13.59	24
	High	5240	10.32	9.72	13.04	24
802.11ac40	Low	5190	9.48	9.96	12.74	24
	High	5230	9.14	9.53	12.35	24
802.11ac 80	-	5210	8.07	8.45	11.27	24

For 5725-5850 MHz:

Mode	Channel	Frequency (MHz)	Conducted Average Power (dBm)		Total (dBm)	Limit (dBm)
			Antenna 0	Antenna 1		
802.11a	Low	5745	11.74	10.71	-	30
	Middle	5785	11.50	10.15	-	30
	High	5825	11.40	9.80	-	30
802.11n-HT20	Low	5745	11.48	10.63	14.09	30
	Middle	5785	11.47	10.10	13.85	30
	High	5825	11.23	9.95	13.65	30
802.11n-HT40	Low	5755	12.12	11.04	14.62	30
	High	5795	12.01	10.52	14.34	30
802.11ac20	Low	5745	11.58	10.70	14.17	30
	Middle	5785	11.39	10.06	13.79	30
	High	5825	11.25	10.03	13.69	30
802.11ac40	Low	5755	12.38	11.04	14.77	30
	High	5795	12.25	10.66	14.54	30
802.11ac 80	-	5775	9.63	9.49	12.57	30

Note:

1. The max antenna gain is 3.66dBi.
2. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power measurements on IEEE 802.11 devices:

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

So:

Directional gain = GANT + Array Gain = 3.66 dBi < 6dBi

FCC §15.407(a) (1) (iv) (3) (5) - POWER SPECTRAL DENSITY

Applicable Standard

(a) Power limits:

(1) For the band 5.15-5.25 GHz.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

(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) The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v01r04

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	65 %
ATM Pressure:	95.2 kPa

* The testing was performed by Tom Tang on 2017-09-26.

Test Mode: Transmitting

Test Result: Pass

For 5150-5250 MHz:

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)		Total (dBm/MHz)	Limit (dBm/MHz)
			Antenna 0	Antenna 1		
802.11a	Low	5180	0.31	-0.32	/	11
	Middle	5200	-0.20	-0.59	/	11
	High	5240	-0.54	-0.98	/	11
802.11n-HT20	Low	5180	0.20	0.45	3.34	10.34
	Middle	5200	-0.47	-0.24	2.66	10.34
	High	5240	-0.58	-0.47	2.49	10.34
802.11n-HT40	Low	5190	-4.40	-4.42	-1.40	10.34
	High	5230	-5.03	-4.65	-1.83	10.34
802.11ac20	Low	5180	0.29	0.21	3.26	10.34
	Middle	5200	0.00	0.13	3.08	10.34
	High	5240	-0.06	-0.04	2.96	10.34
802.11ac40	Low	5190	-4.94	-4.35	-1.62	10.34
	High	5230	-5.13	-4.74	-1.92	10.34
802.11ac80	-	5210	-9.02	-8.56	-5.77	10.34

Note:

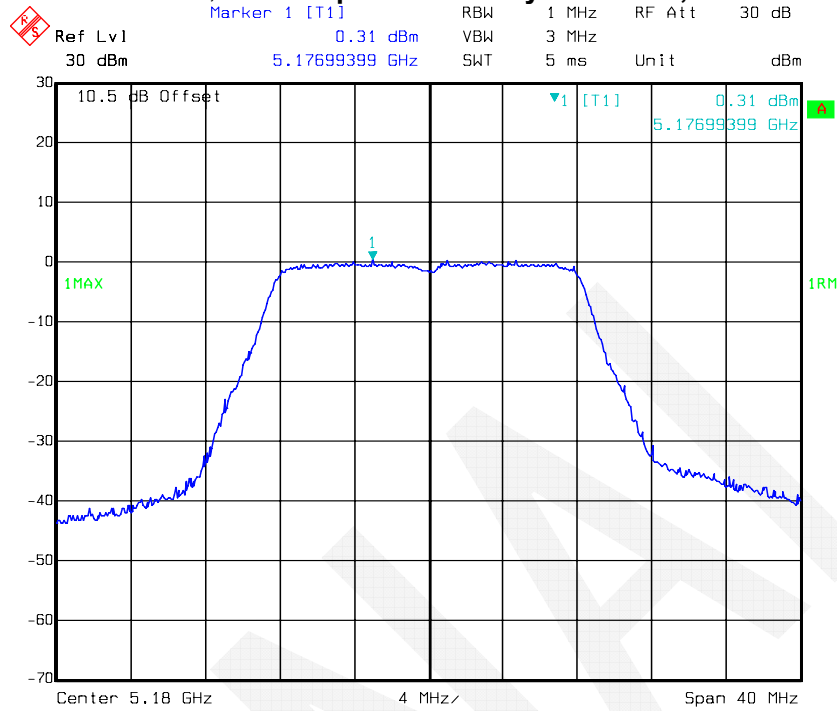
1. The max antenna gain is 3.66dBi.
2. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density measurements on IEEE 802.11 devices:

$$\text{Array Gain} = 10 \cdot \log(N_{\text{ANT}}/N_{\text{SS}}) \text{dB}$$

So:

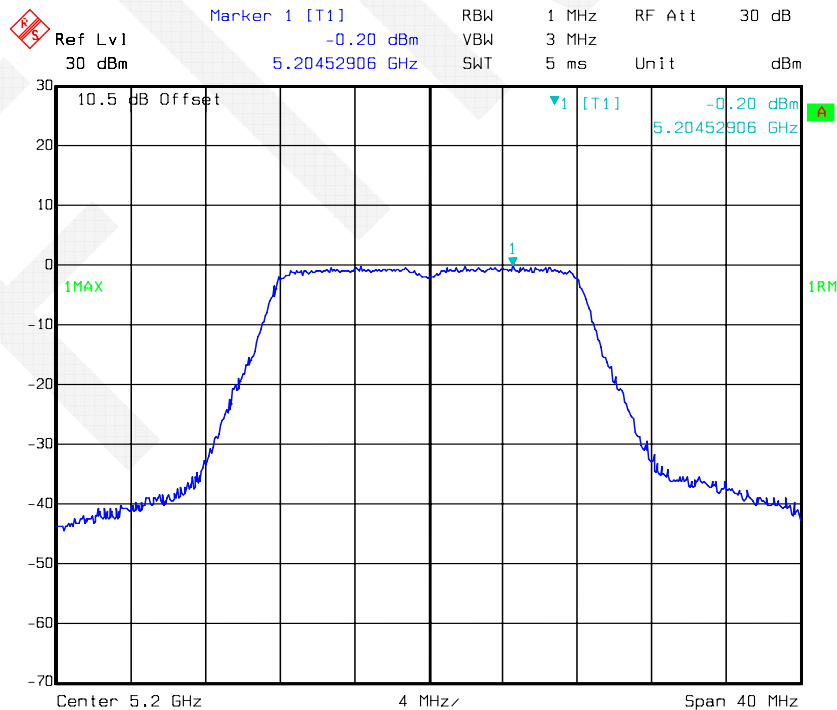
Directional gain = GANT + Array Gain = 3.66+10*log(2)=6.66dBi>6dBi
So the power density Limit was reduced 0.66dB in MIMO mode.

802.11a mode, Power Spectral Density-5180 MHz, Antenna 0



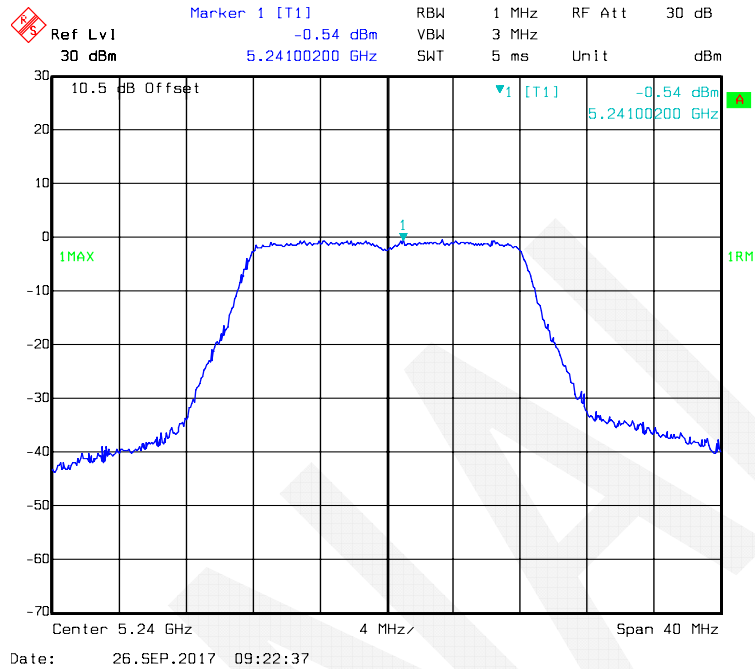
Date: 26.SEP.2017 09:16:30

802.11a mode, Power Spectral Density-5200 MHz, Antenna 0

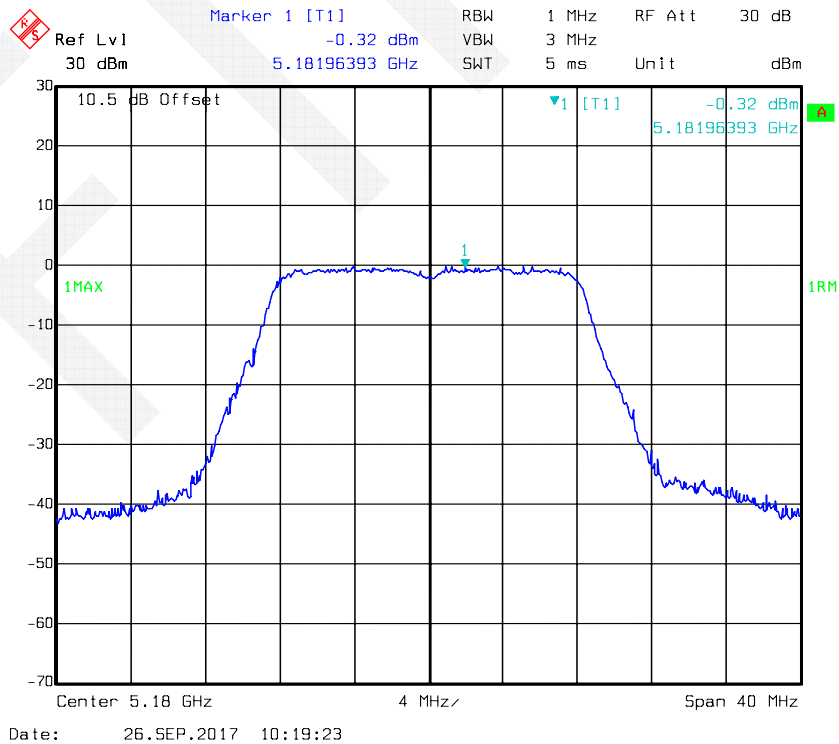


Date: 26.SEP.2017 09:20:43

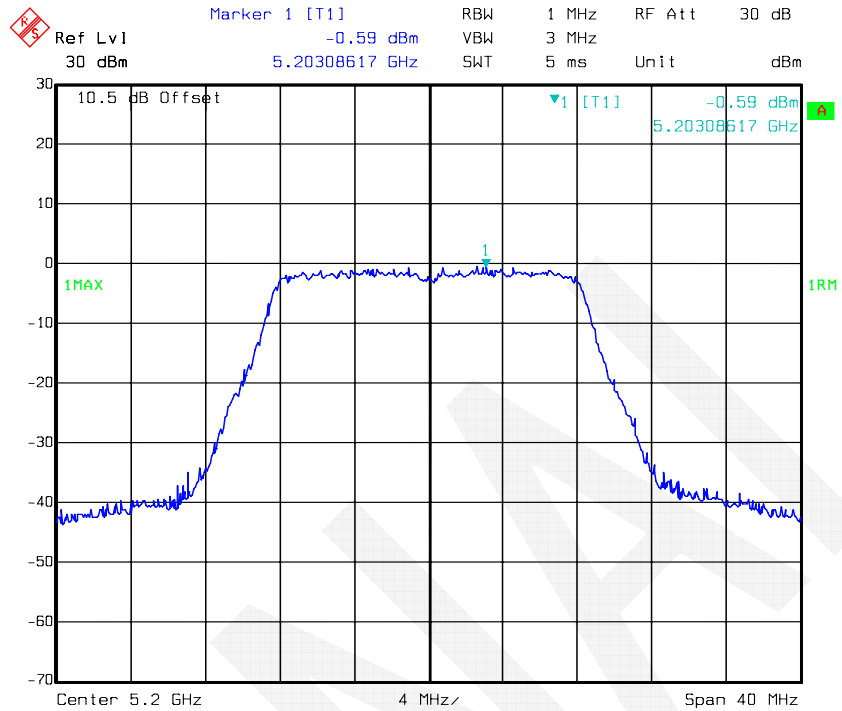
802.11a mode, Power Spectral Density-5240 MHz, Antenna 0



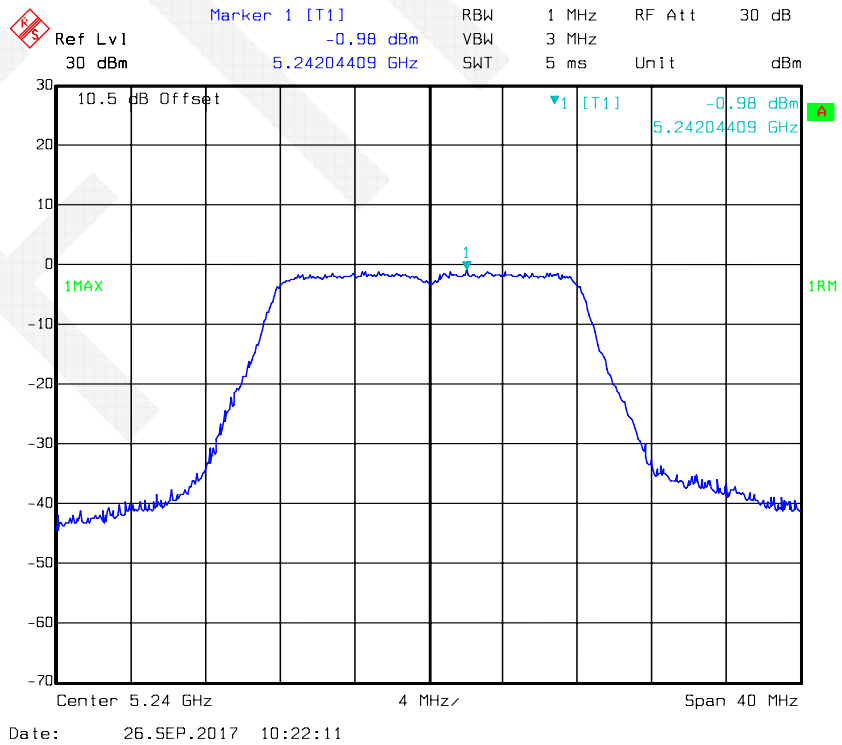
802.11a mode, Power Spectral Density-5180 MHz, Antenna 1



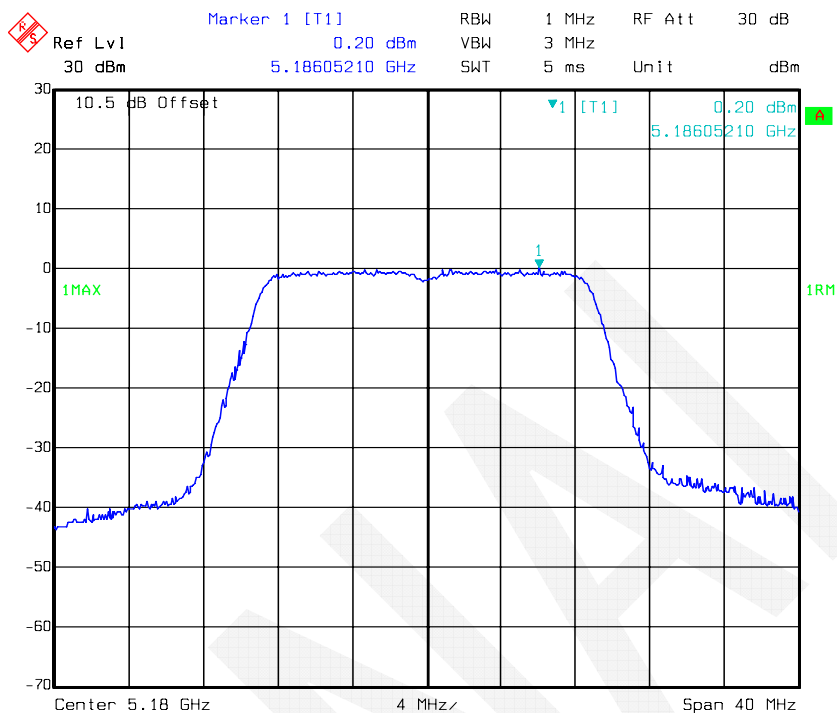
802.11a mode, Power Spectral Density-5200 MHz, Antenna 1



802.11a mode, Power Spectral Density-5240 MHz, Antenna 1

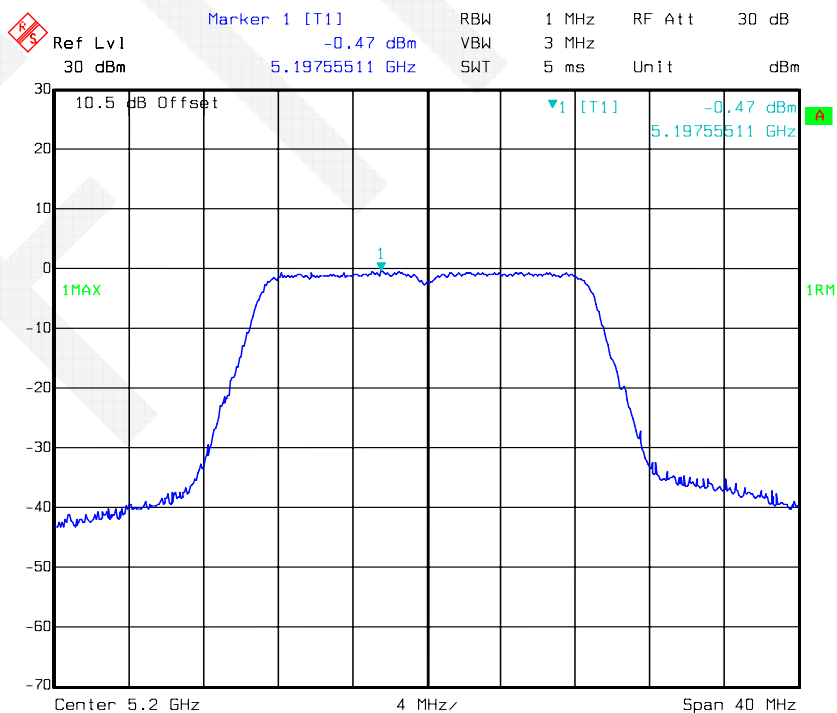


802.11n-HT20 mode, Power Spectral Density-5180 MHz, Antenna 0



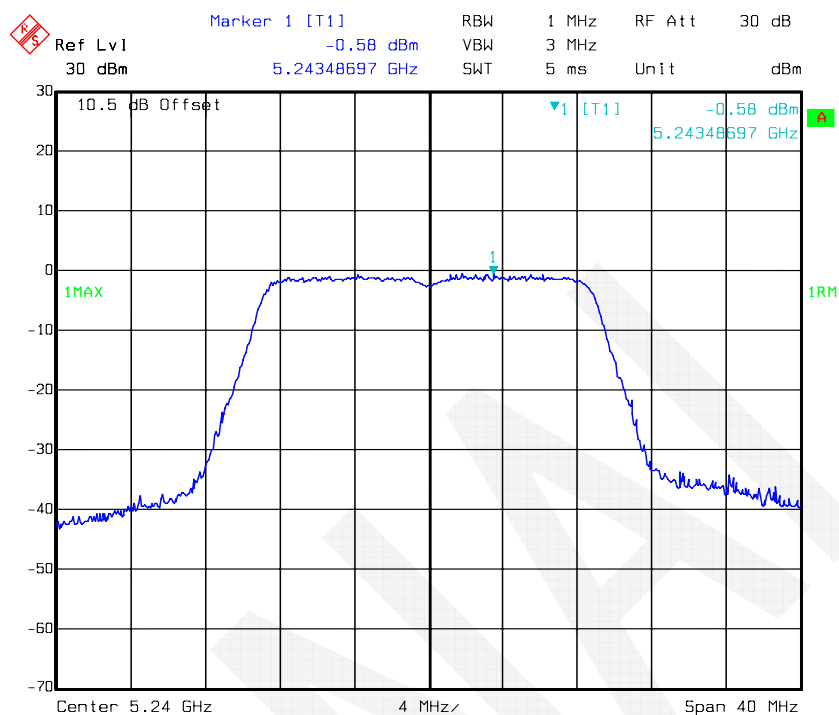
Date: 26.SEP.2017 09:24:54

802.11n-HT20 mode, Power Spectral Density-5200 MHz, Antenna 0



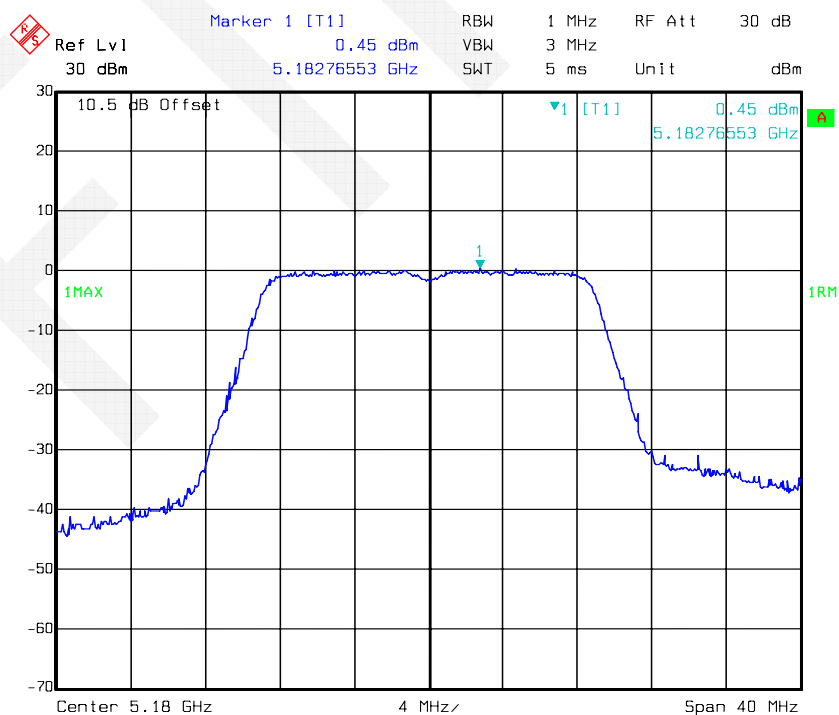
Date: 26.SEP.2017 09:26:53

802.11n-HT20 mode, Power Spectral Density-5240 MHz, Antenna 0



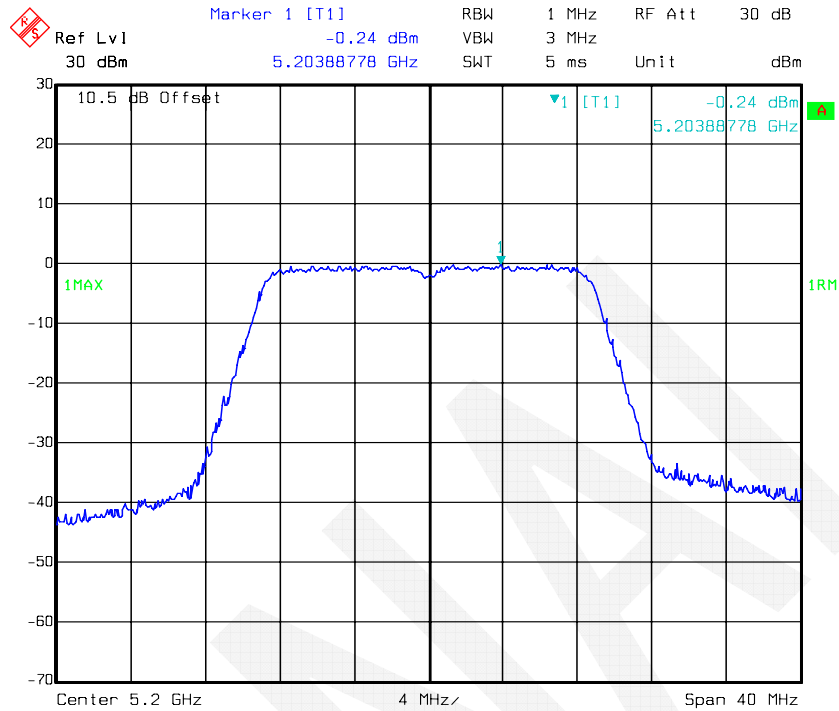
Date: 26.SEP.2017 09:28:17

802.11n-HT20 mode, Power Spectral Density-5180 MHz, Antenna 1



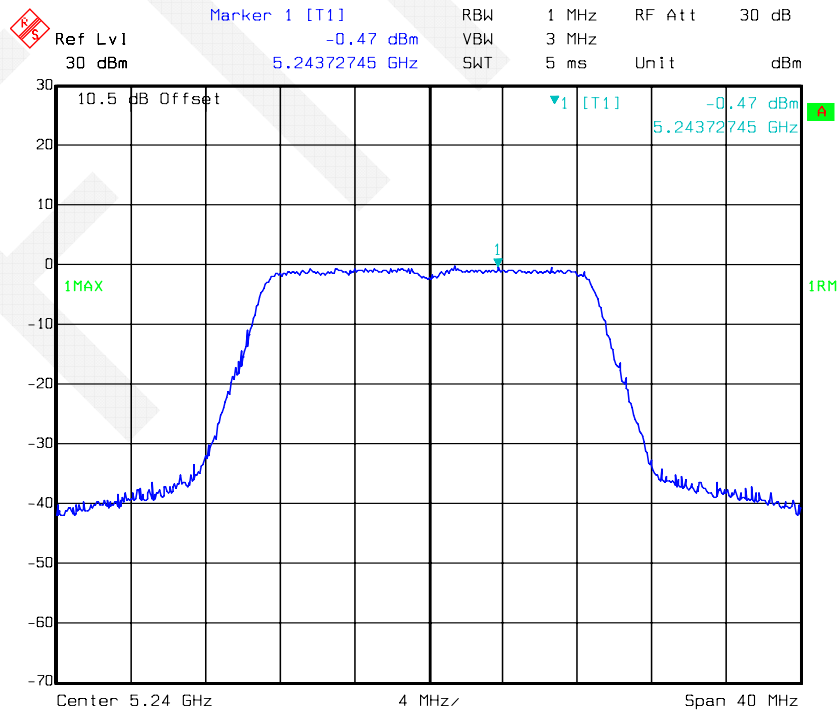
Date: 26.SEP.2017 10:36:24

802.11n-HT20 mode, Power Spectral Density-5200 MHz, Antenna 1



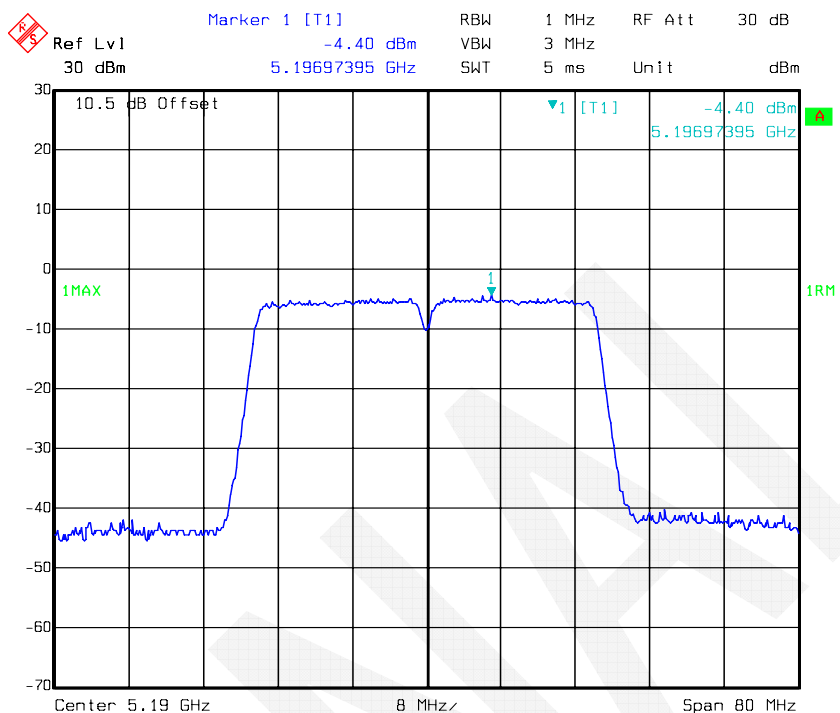
Date: 26.SEP.2017 10:38:04

802.11n-HT20 mode, Power Spectral Density-5240 MHz, Antenna 1



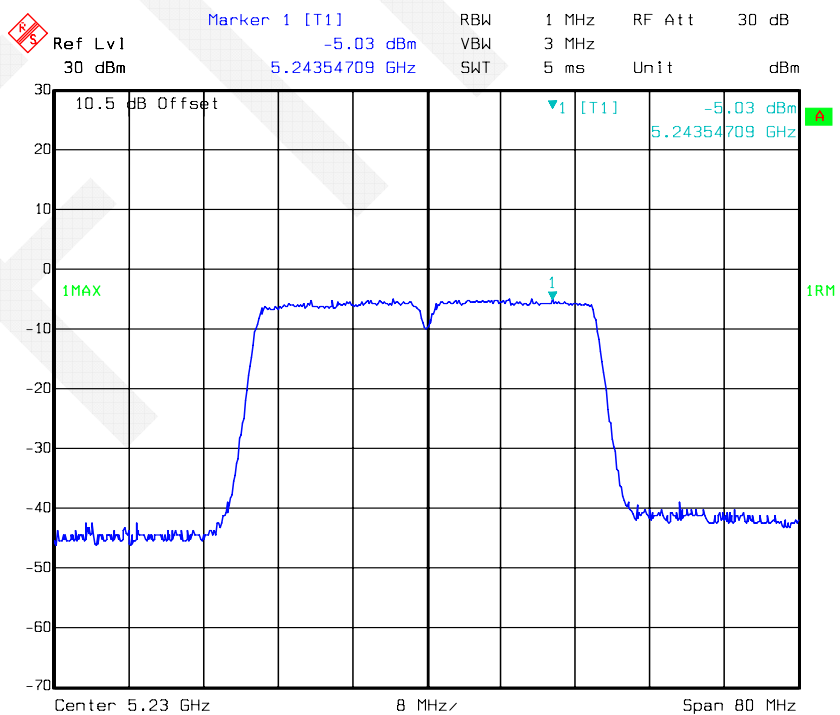
Date: 26.SEP.2017 10:41:19

802.11n-HT40 mode, Power Spectral Density-5190 MHz, Antenna 0



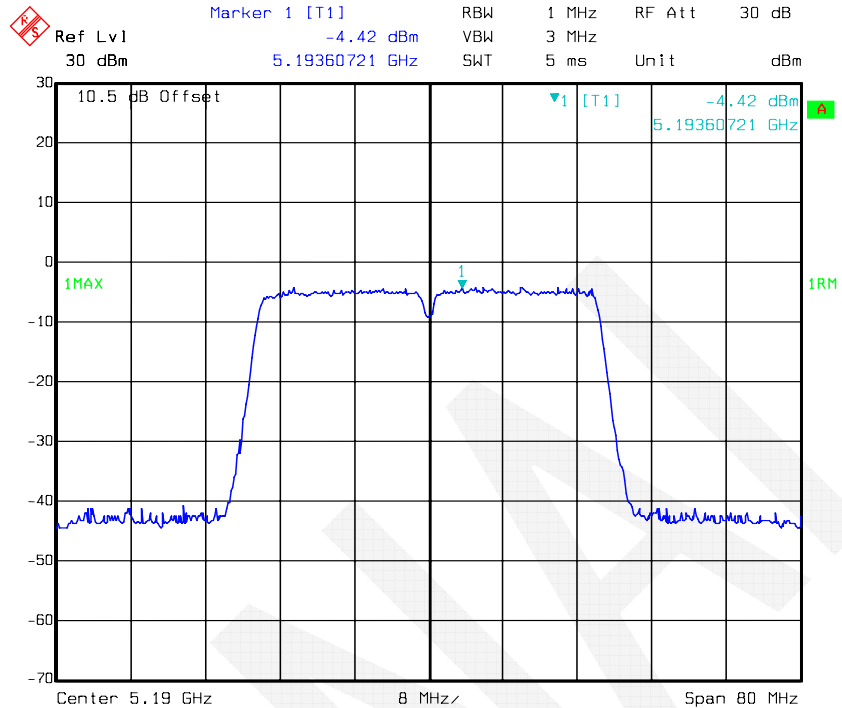
Date: 26.SEP.2017 09:42:37

802.11n-HT40 mode, Power Spectral Density-5230 MHz, Antenna 0



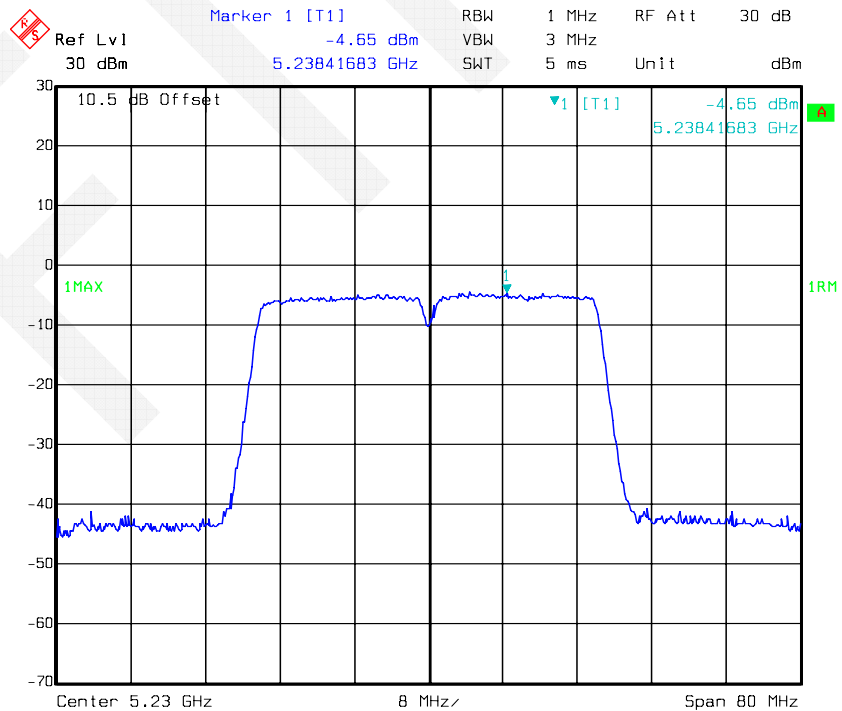
Date: 26.SEP.2017 09:44:13

802.11n-HT40 mode, Power Spectral Density-5190 MHz, Antenna 1



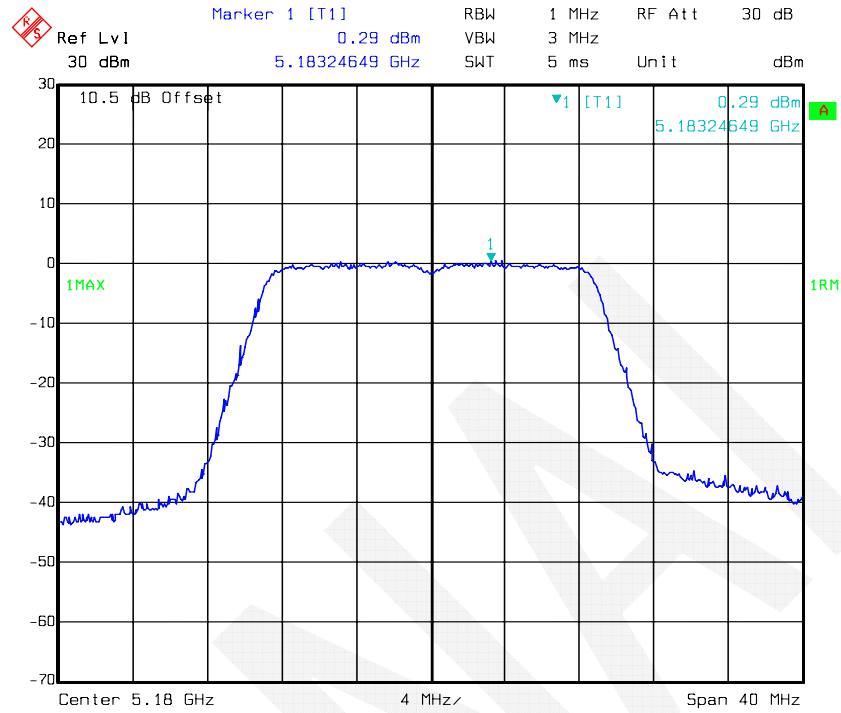
Date: 26.SEP.2017 10:43:11

802.11n-HT40 mode, Power Spectral Density-5230 MHz, Antenna 1



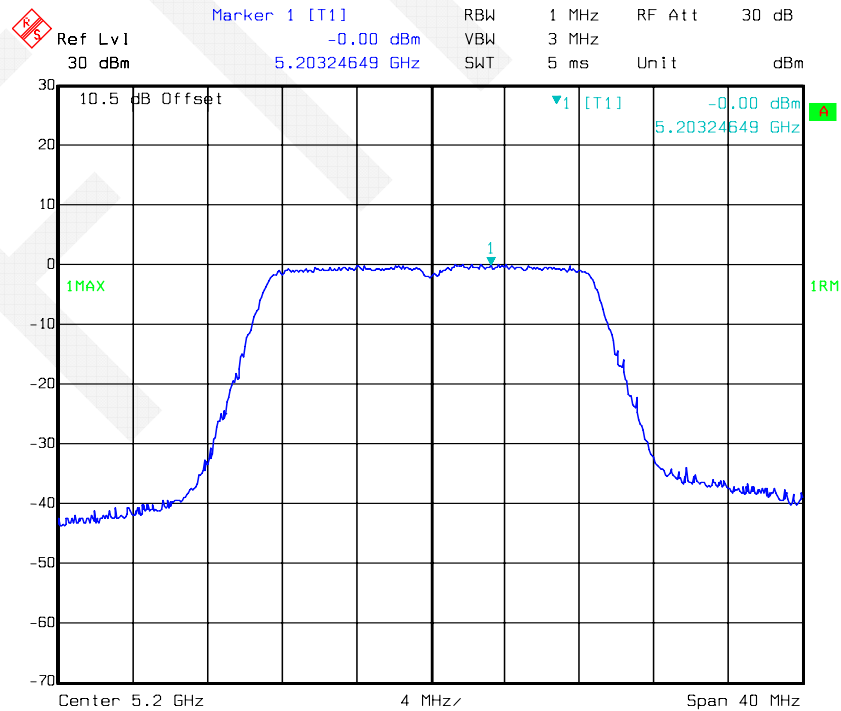
Date: 26.SEP.2017 10:46:14

802.11ac20 mode, Power Spectral Density-5180 MHz, Antenna 0



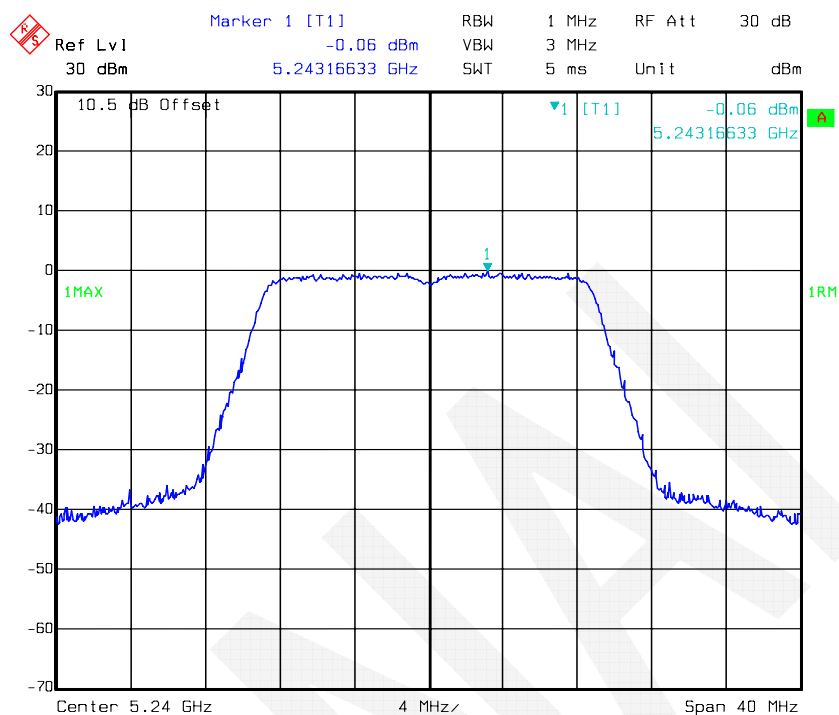
Date: 26.SEP.2017 11:24:10

802.11ac20 mode, Power Spectral Density-5200 MHz, Antenna 0



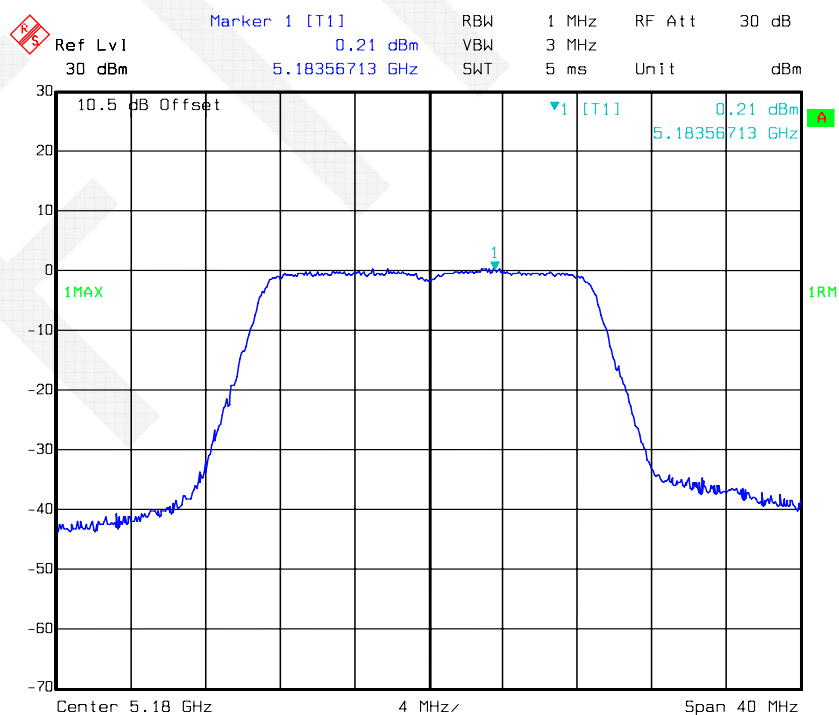
Date: 26.SEP.2017 11:26:29

802.11ac20 mode, Power Spectral Density-5240 MHz, Antenna 0



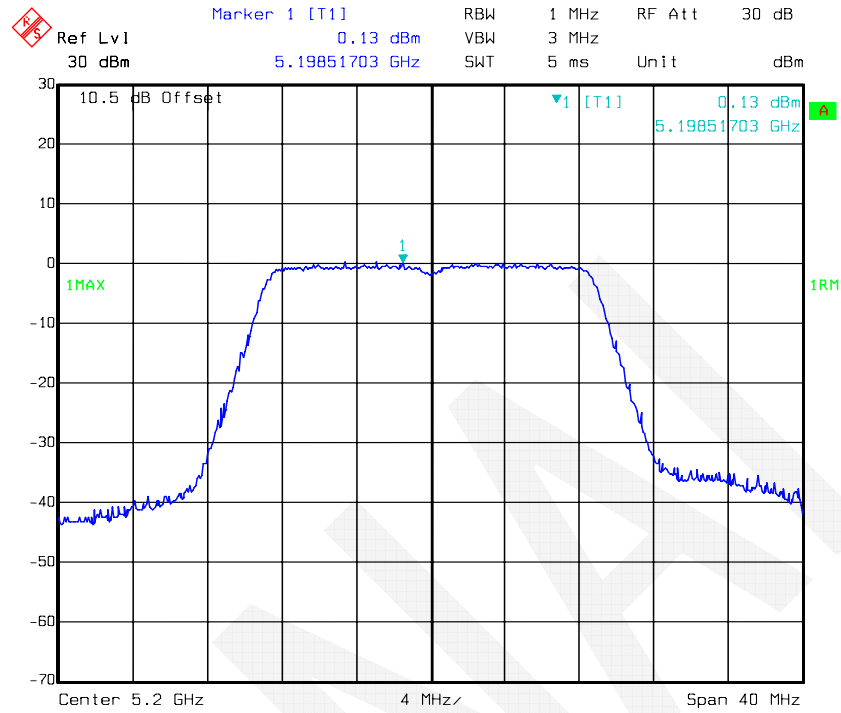
Date: 26.SEP.2017 11:25:15

802.11ac20 mode, Power Spectral Density-5180 MHz, Antenna 1



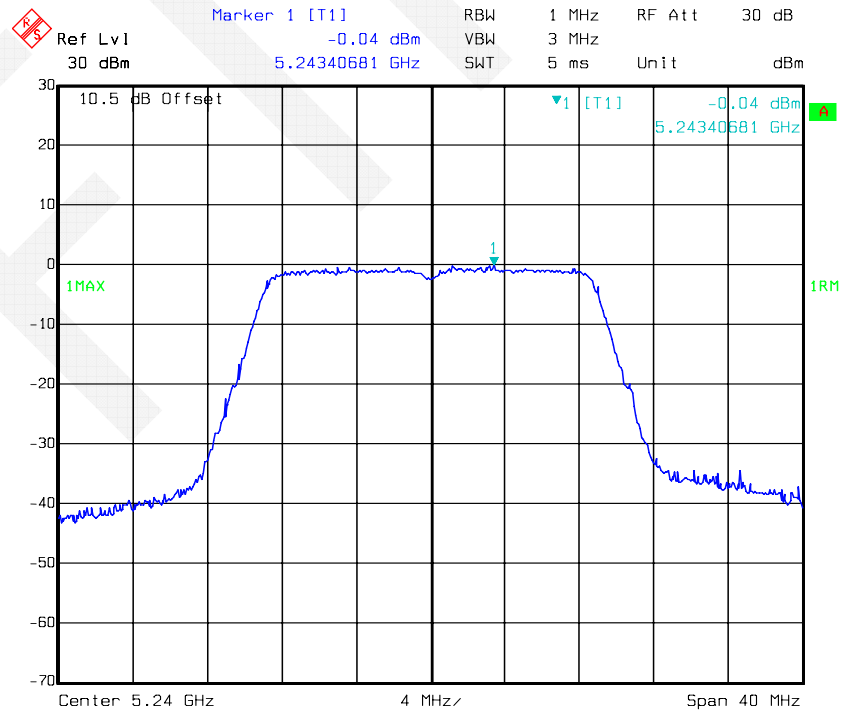
Date: 26.SEP.2017 11:27:33

802.11ac20 mode, Power Spectral Density-5200 MHz, Antenna 1



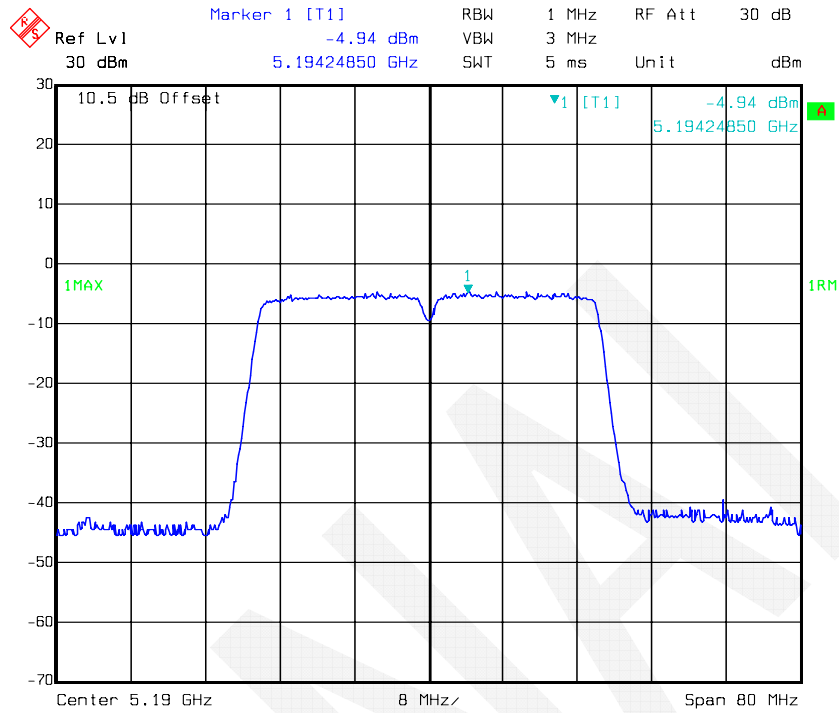
Date: 26.SEP.2017 11:28:32

802.11ac20 mode, Power Spectral Density-5240 MHz, Antenna 1



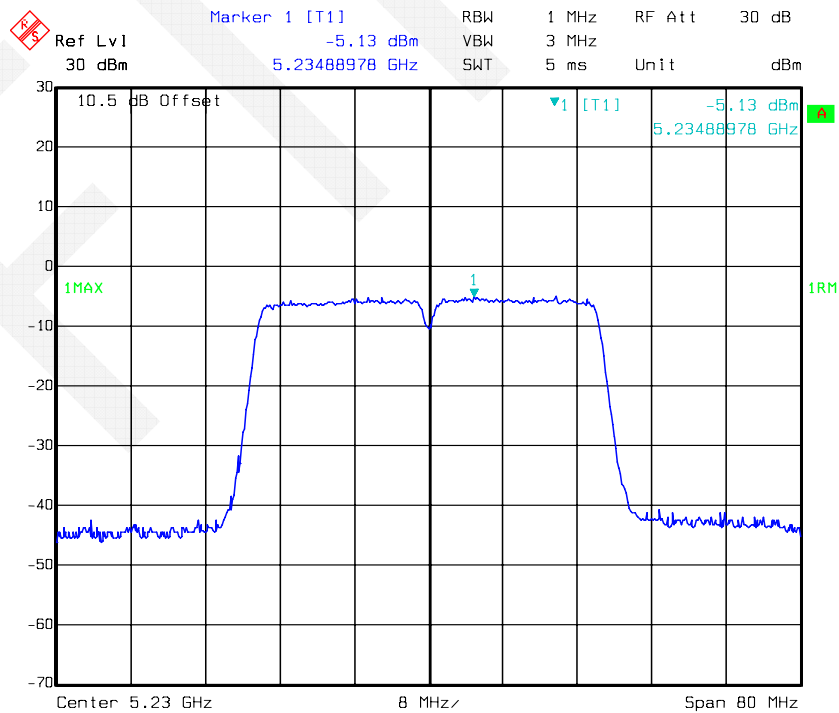
Date: 26.SEP.2017 11:30:44

802.11ac40 mode, Power Spectral Density-5190 MHz, Antenna 0



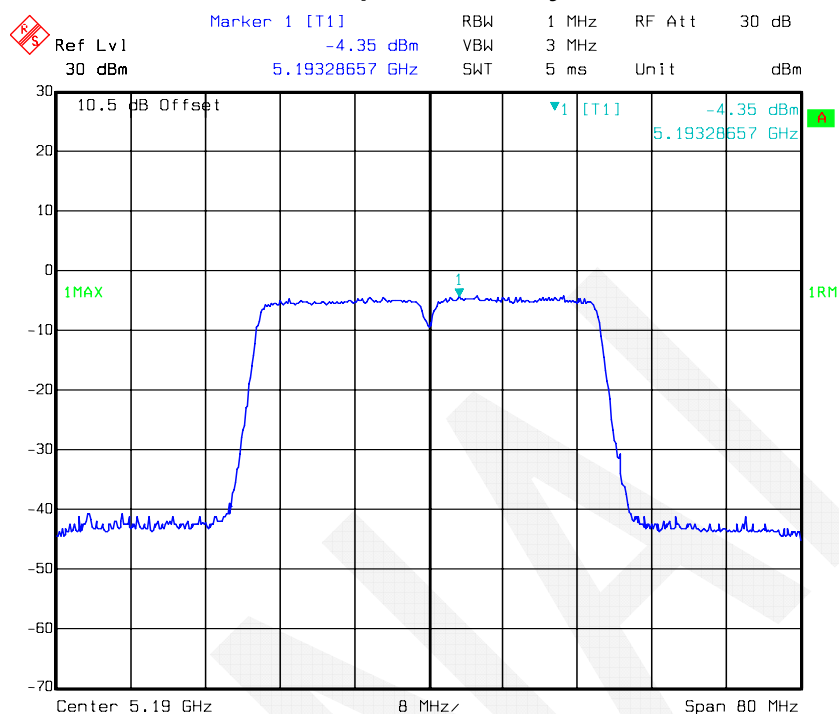
Date: 26.SEP.2017 09:38:53

802.11ac40 mode, Power Spectral Density-5230 MHz, Antenna 0



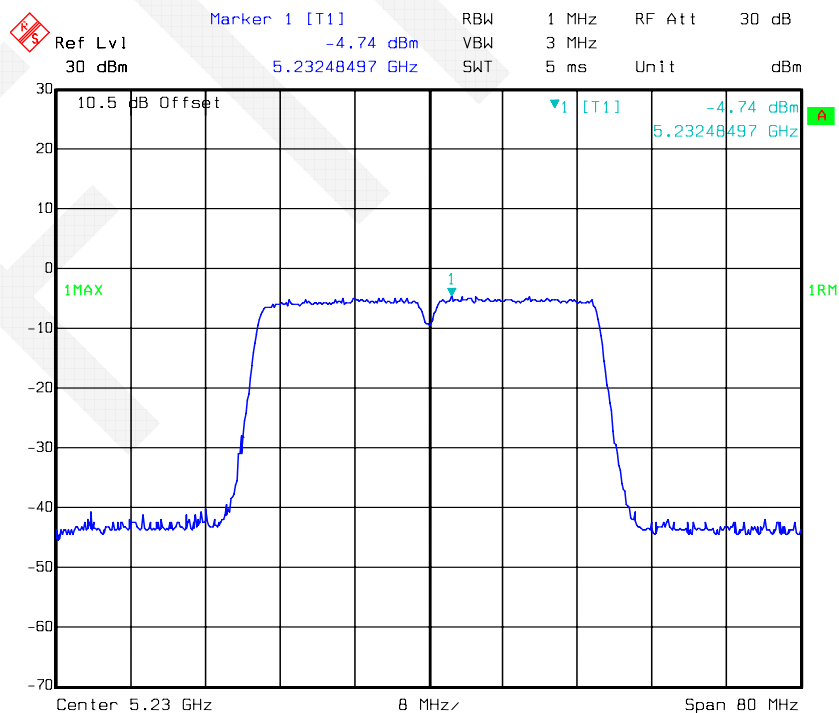
Date: 26.SEP.2017 09:40:40

802.11ac40 mode, Power Spectral Density-5190 MHz, Antenna 1



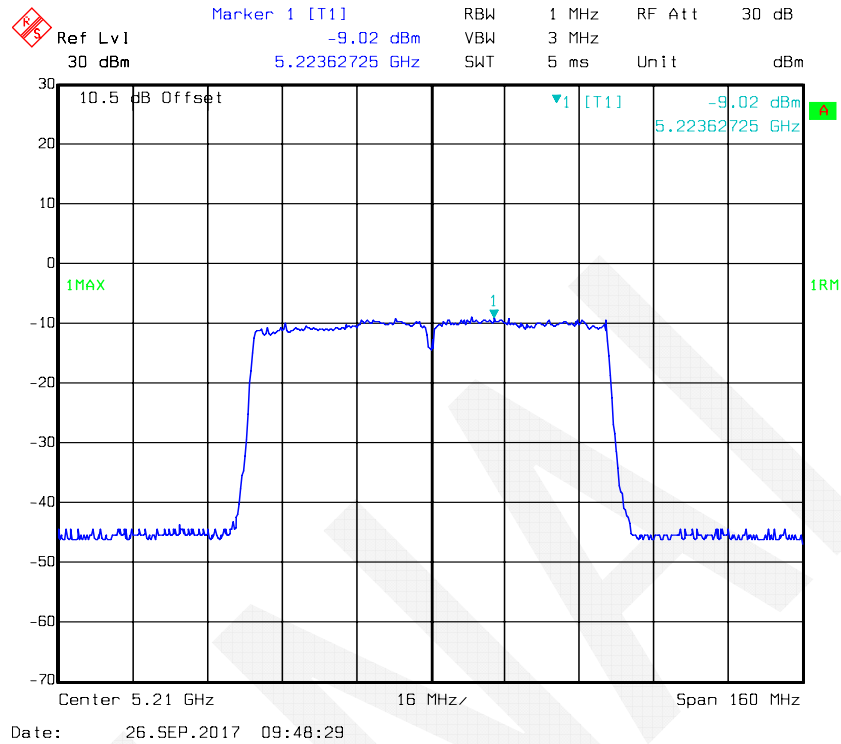
Date: 26.SEP.2017 10:48:32

802.11ac40 mode, Power Spectral Density-5230 MHz, Antenna 1

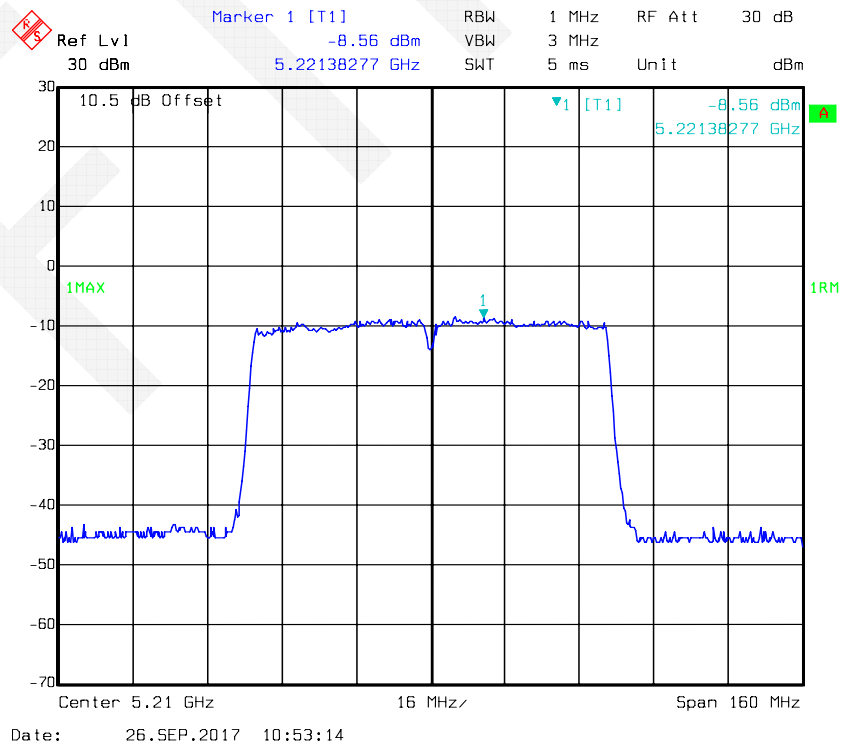


Date: 26.SEP.2017 10:51:32

802.11ac 80 mode, Power Spectral Density-5210 MHz, Antenna 0



802.11ac 80 mode, Power Spectral Density-5210 MHz, Antenna 1



For 5725-5850 MHz:

Mode	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)		Total (dBm/500kHz)	Limit (dBm/500kHz)
			Antenna 0	Antenna 1		
802.11a	Low	5745	-0.32	-1.27	-	30
	Middle	5785	-0.64	-1.99	-	30
	High	5825	-0.61	-2.33	-	30
802.11n-HT20	Low	5745	-0.52	-1.52	2.02	29.34
	Middle	5785	-0.72	-1.71	1.82	29.34
	High	5825	-0.63	-2.05	1.73	29.34
802.11n-HT40	Low	5755	-2.54	-3.82	-0.12	29.34
	High	5795	-3.19	-4.32	-0.71	29.34
802.11ac20	Low	5745	-0.33	-1.47	2.15	29.34
	Middle	5785	-0.54	-1.97	1.81	29.34
	High	5825	-0.56	-2.38	1.63	29.34
802.11ac40	Low	5755	-2.80	-3.89	-0.30	29.34
	High	5795	-3.07	-4.62	-0.77	29.34
802.11ac80	-	5775	-6.62	-7.81	-4.16	29.34

Note:

1. The max antenna gain is 3.66dBi.
2. The device employed Cyclic Delay Diversity (CDD) for 802.11 MIMO transmitting, per KDB 662911 D01 Multiple Transmitter Output v02r01, for power spectral density measurements on IEEE 802.11 devices:

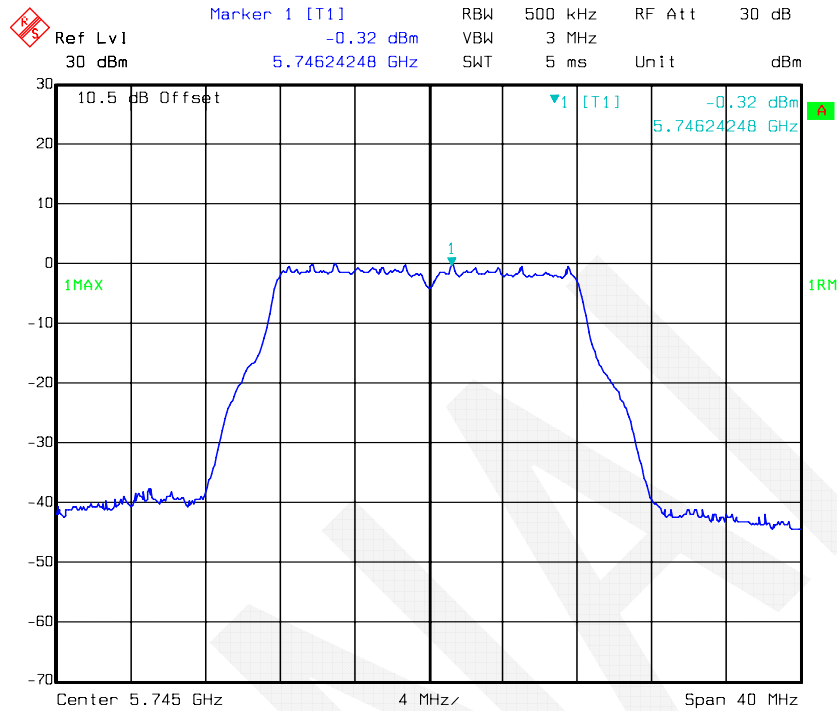
$$\text{Array Gain} = 10 \cdot \log(N_{\text{ANT}}/N_{\text{SS}}) \text{dB}$$

So:

$$\text{Directional gain} = \text{GANT} + \text{Array Gain} = 3.66 + 10 \cdot \log(2) = 6.66 \text{dBi} > 6 \text{dBi}$$

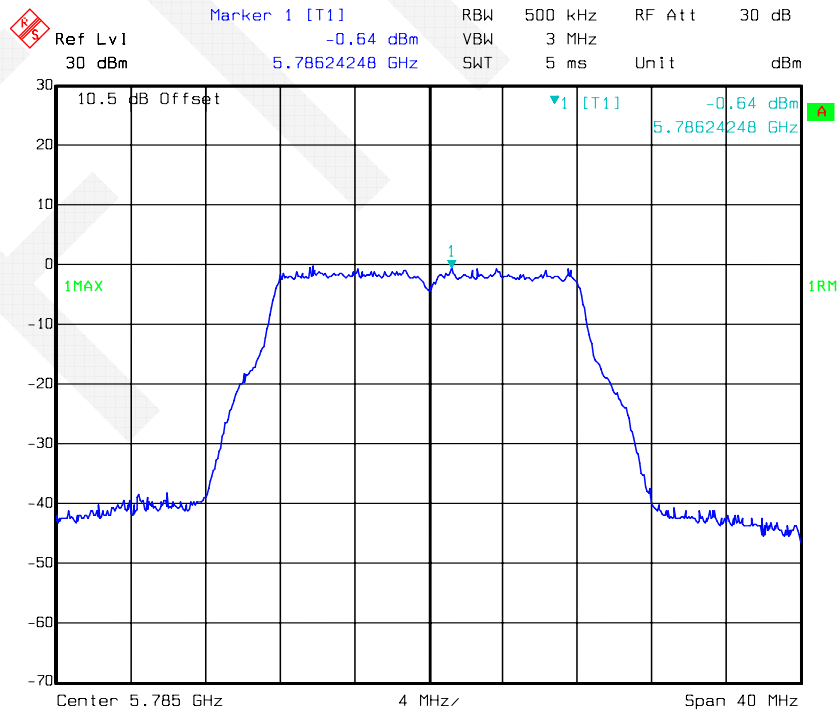
So the power density Limit was reduced 0.66dB in MIMO mode.

802.11a mode, Power Spectral Density-5745 MHz, Antenna 0



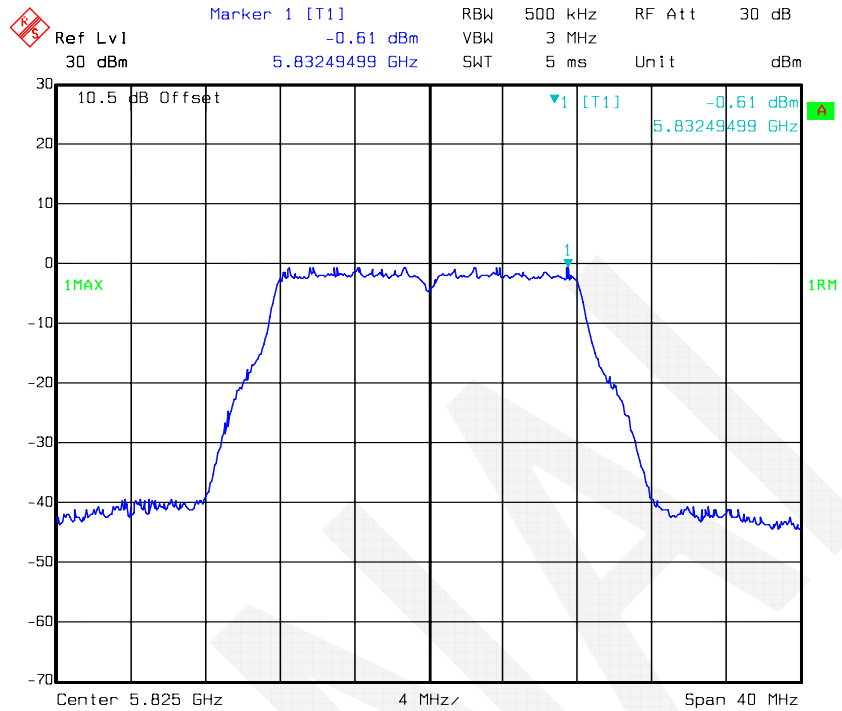
Date: 26.SEP.2017 14:43:58

802.11a mode, Power Spectral Density-5785 MHz, Antenna 0

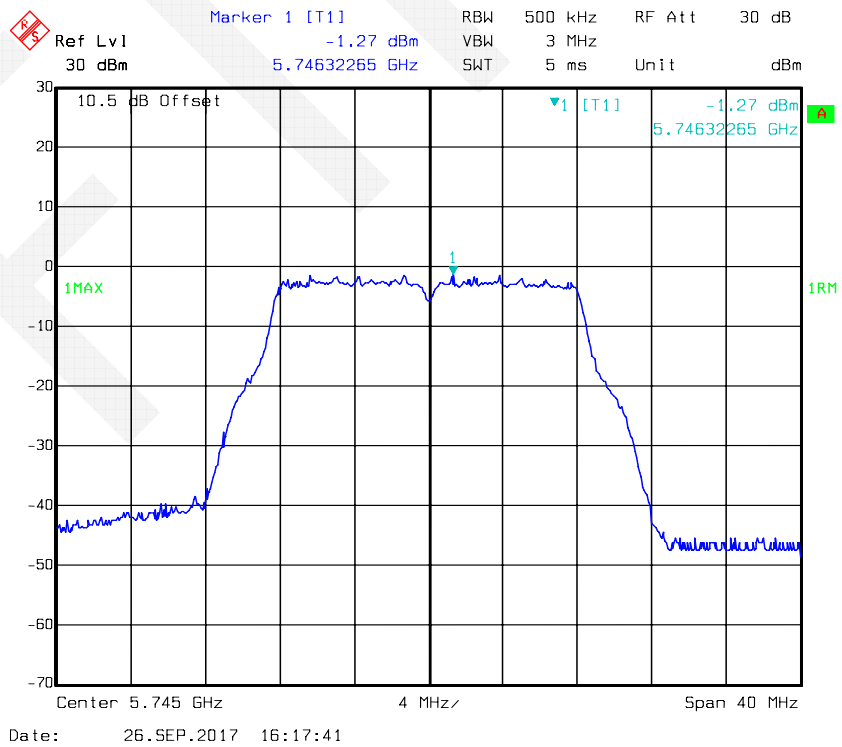


Date: 26.SEP.2017 14:45:15

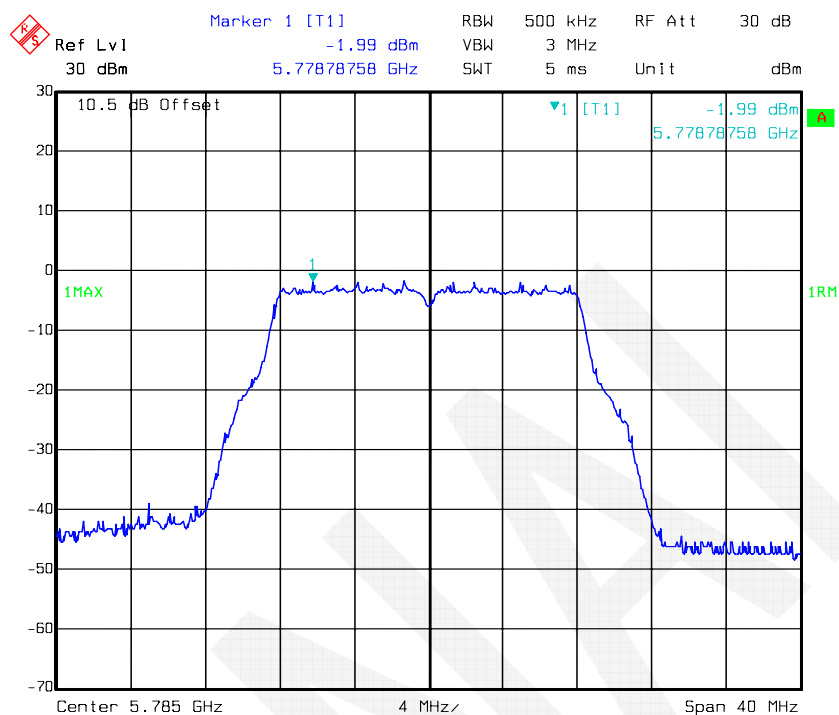
802.11a mode, Power Spectral Density-5825 MHz, Antenna 0



802.11a mode, Power Spectral Density-5745 MHz, Antenna 1

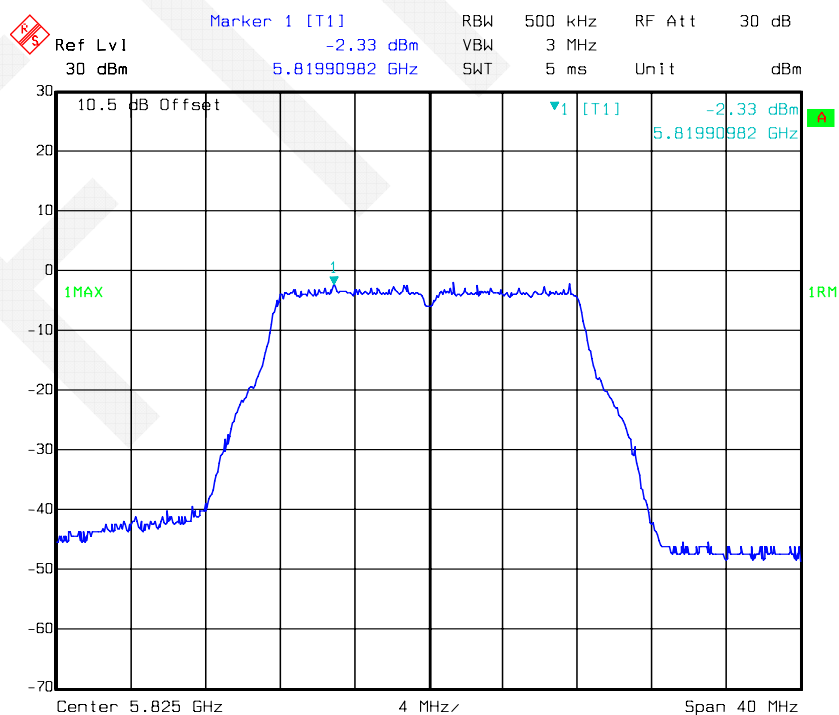


802.11a mode, Power Spectral Density-5785 MHz, Antenna 1



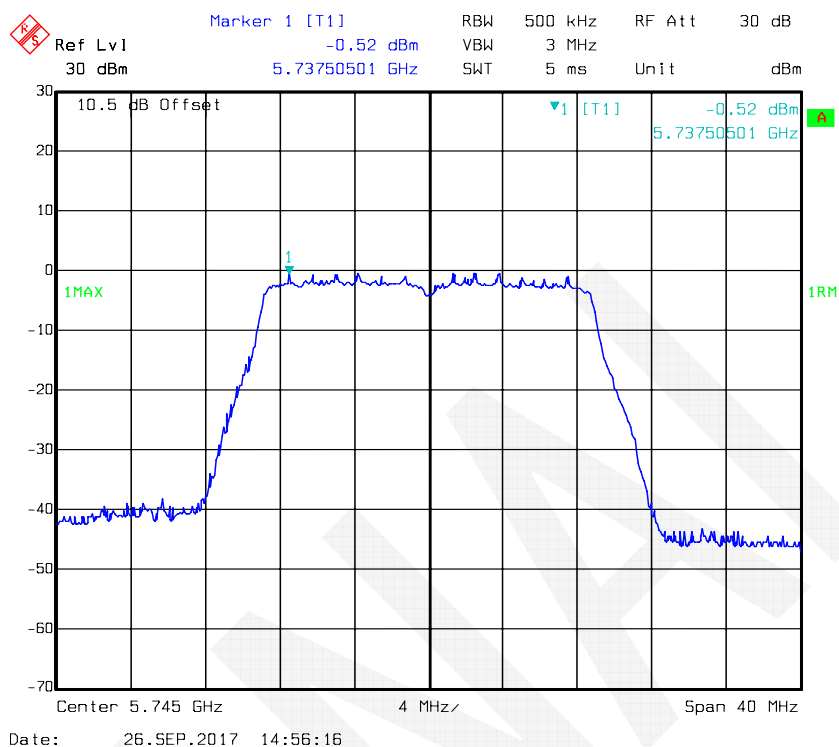
Date: 26.SEP.2017 16:18:15

802.11a mode, Power Spectral Density-5825 MHz, Antenna 1

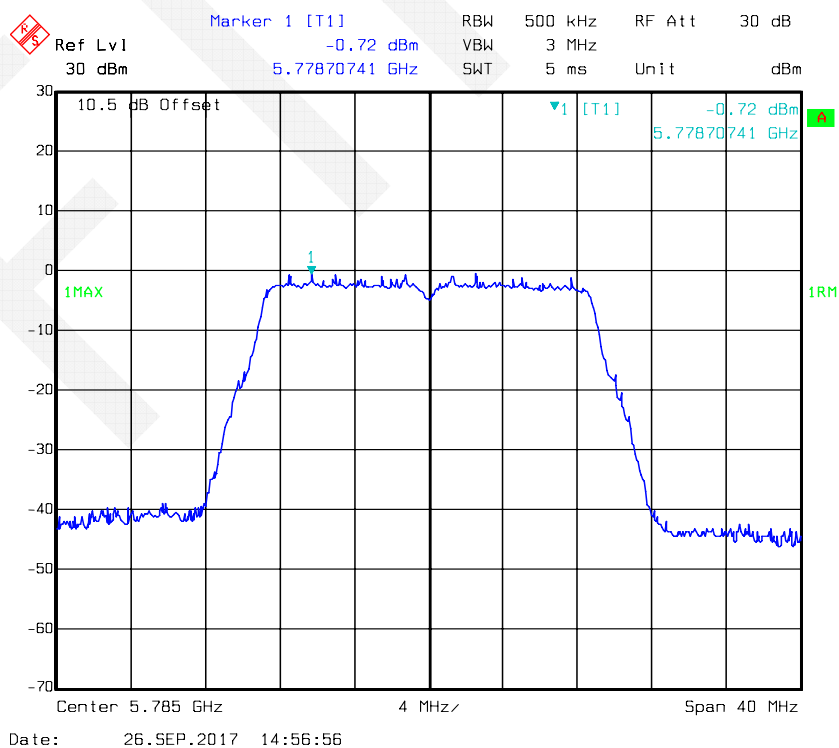


Date: 26.SEP.2017 16:18:52

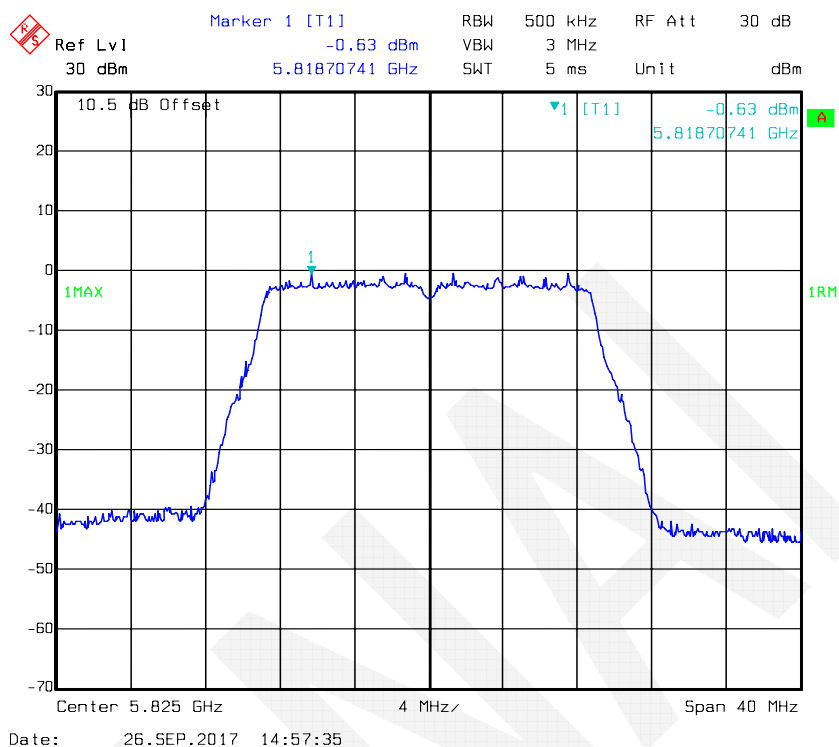
802.11n-HT20 mode, Power Spectral Density-5745 MHz, Antenna 0



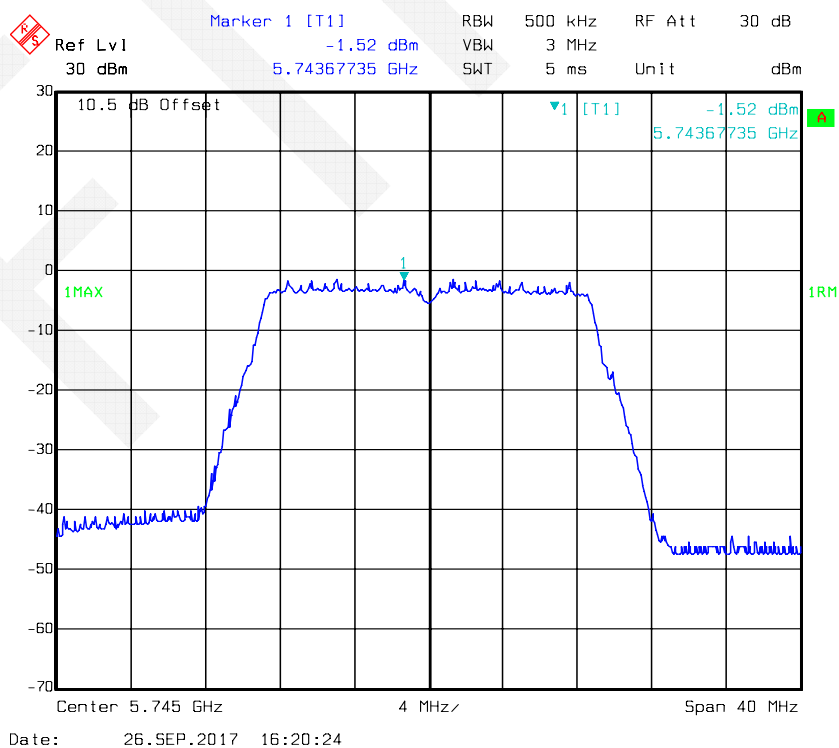
802.11n-HT20 mode, Power Spectral Density-5785 MHz, Antenna 0



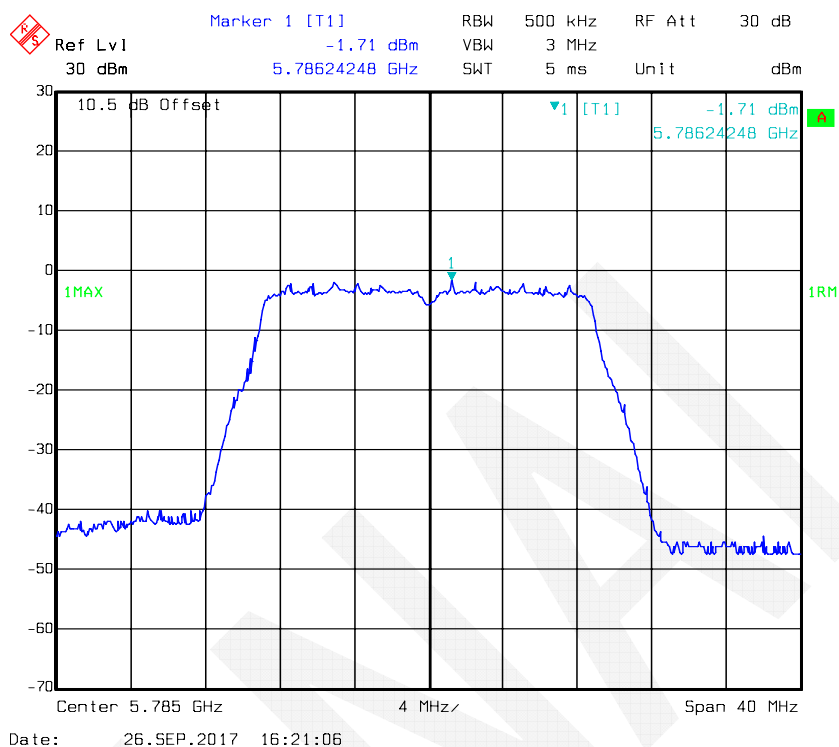
802.11n-HT20 mode, Power Spectral Density-5825 MHz, Antenna 0



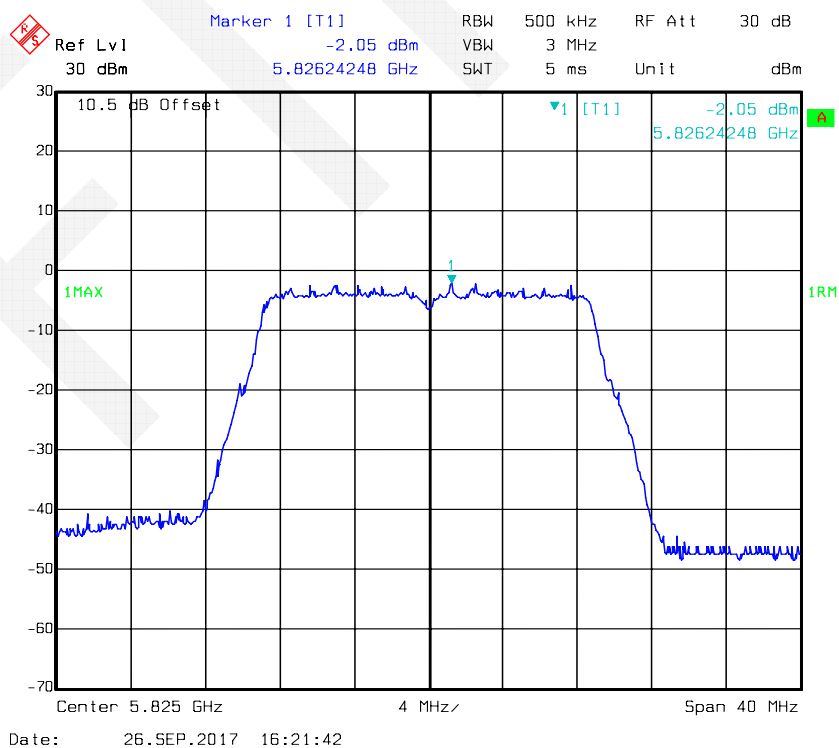
802.11n-HT20 mode, Power Spectral Density-5745 MHz, Antenna 1



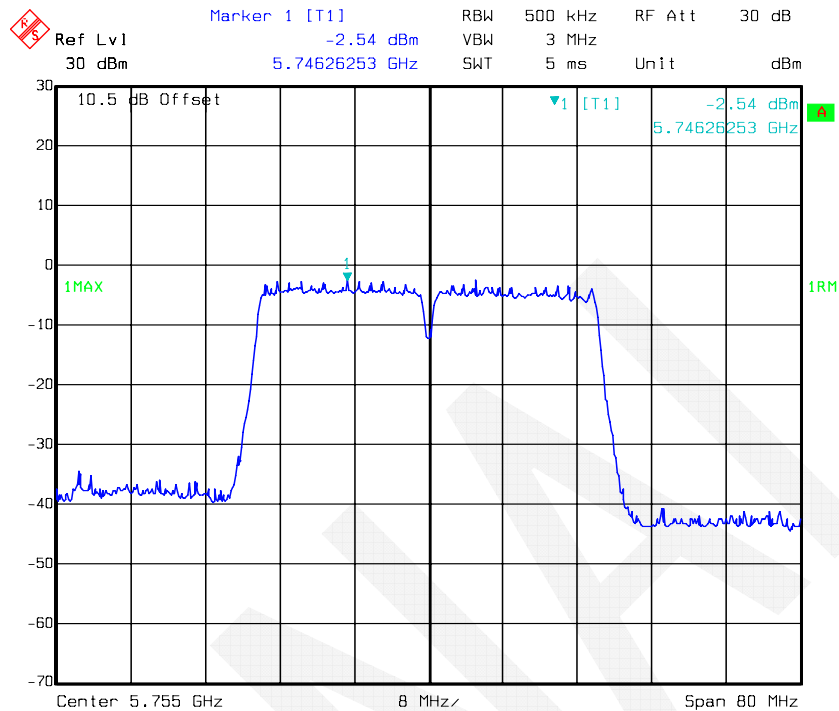
802.11n-HT20 mode, Power Spectral Density-5785 MHz, Antenna 1



802.11n-HT20 mode, Power Spectral Density-5825 MHz, Antenna 1

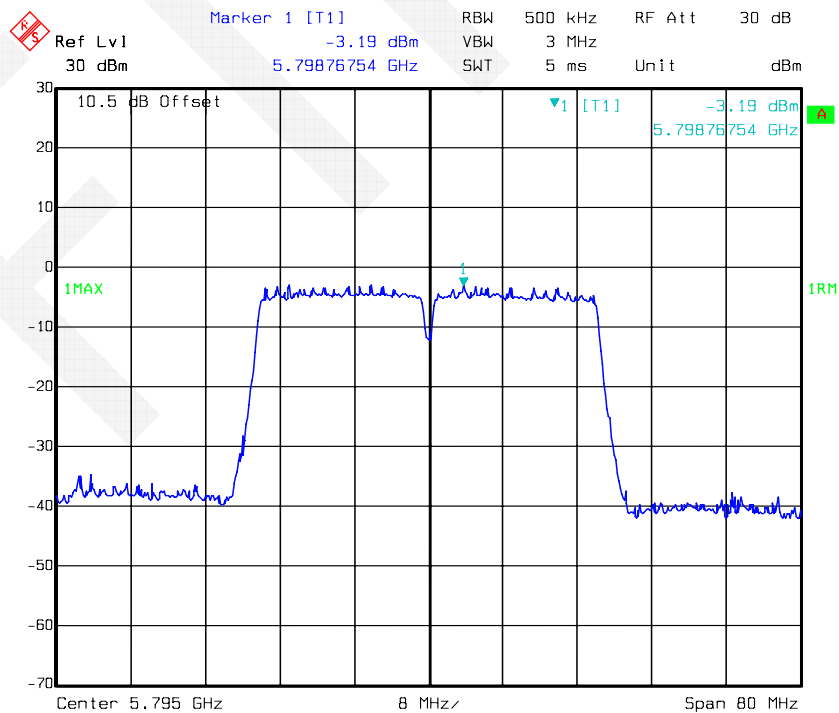


802.11n-HT40 mode, Power Spectral Density-5755 MHz, Antenna 0



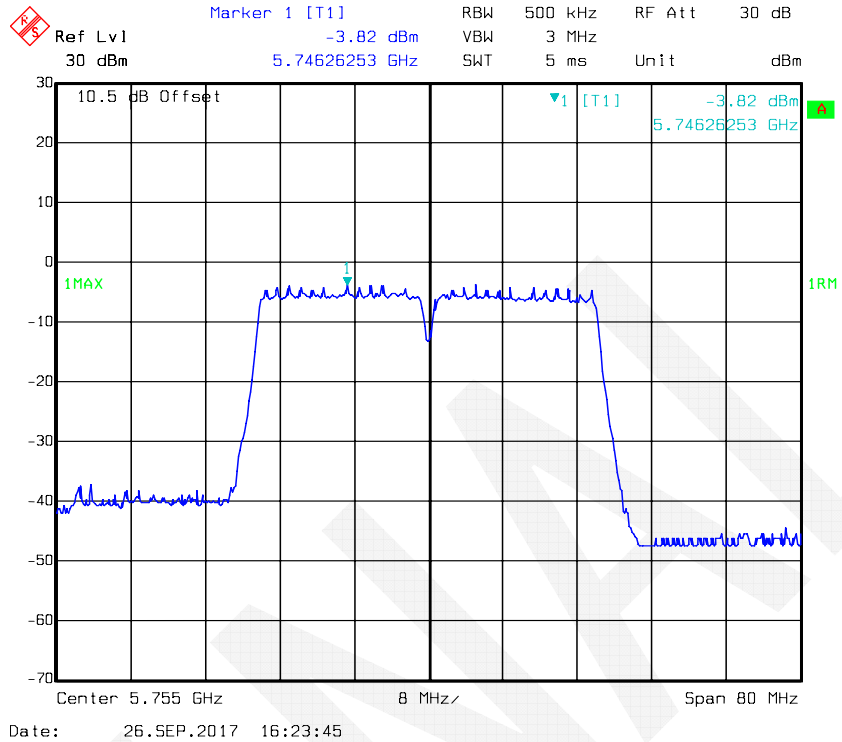
Date: 26.SEP.2017 14:59:27

802.11n-HT40 mode, Power Spectral Density-5795 MHz, Antenna 0

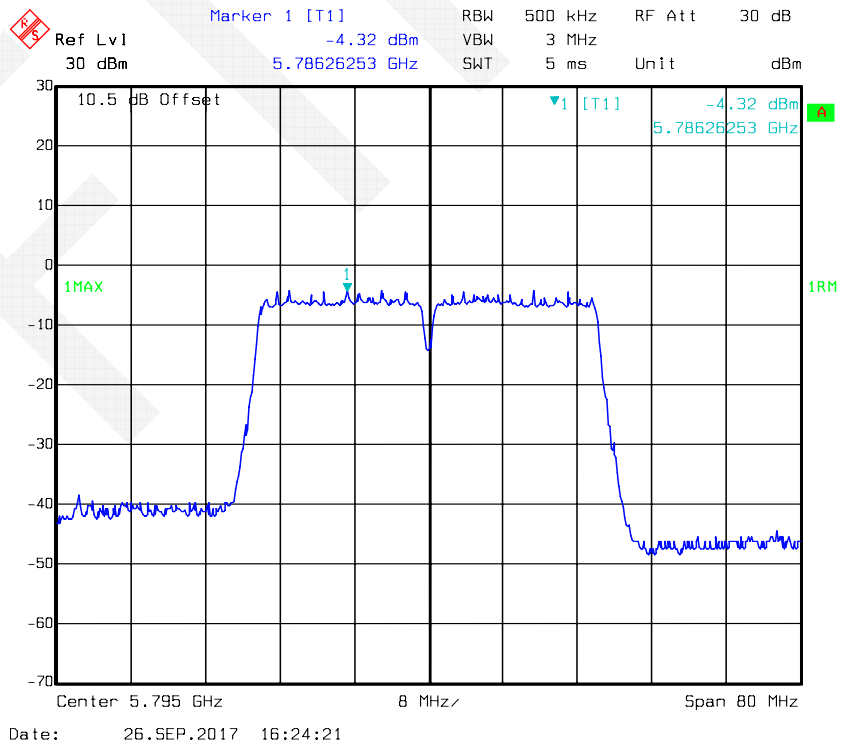


Date: 26.SEP.2017 15:00:03

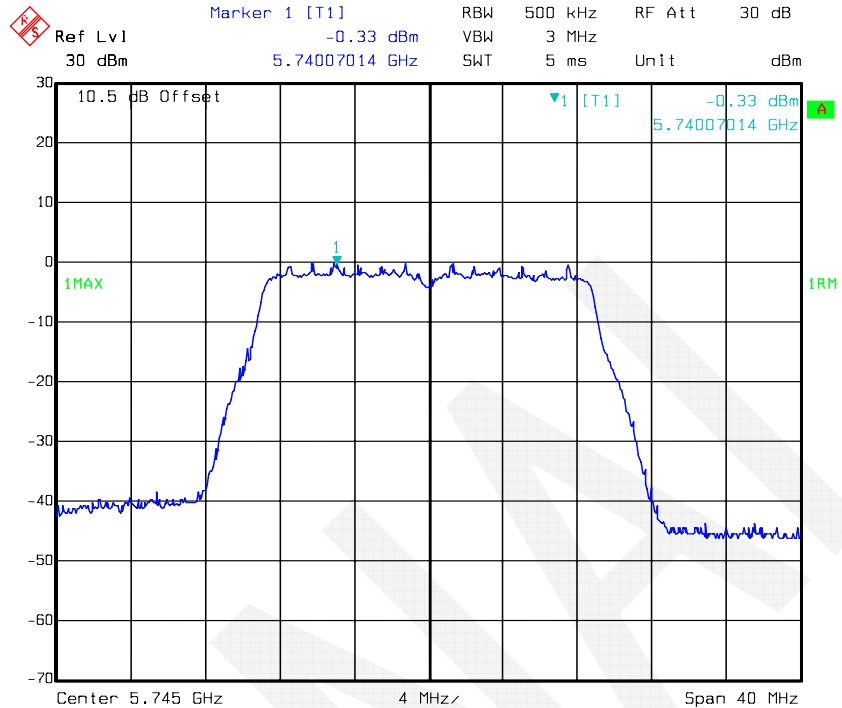
802.11n-HT40 mode, Power Spectral Density-5755 MHz, Antenna 1



802.11n-HT40 mode, Power Spectral Density-5795 MHz, Antenna 1

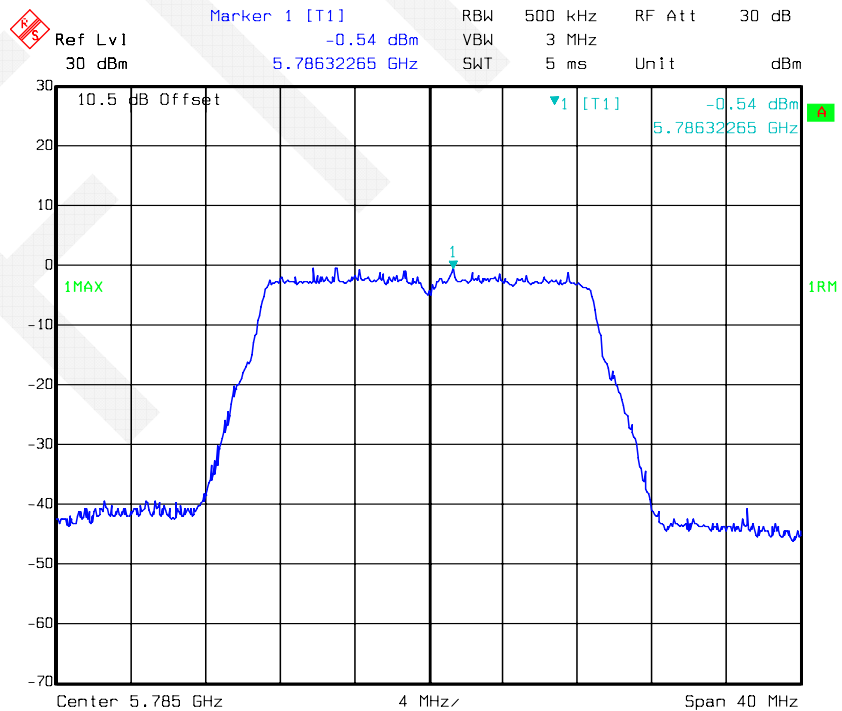


802.11ac20 mode, Power Spectral Density-5745 MHz, Antenna 0



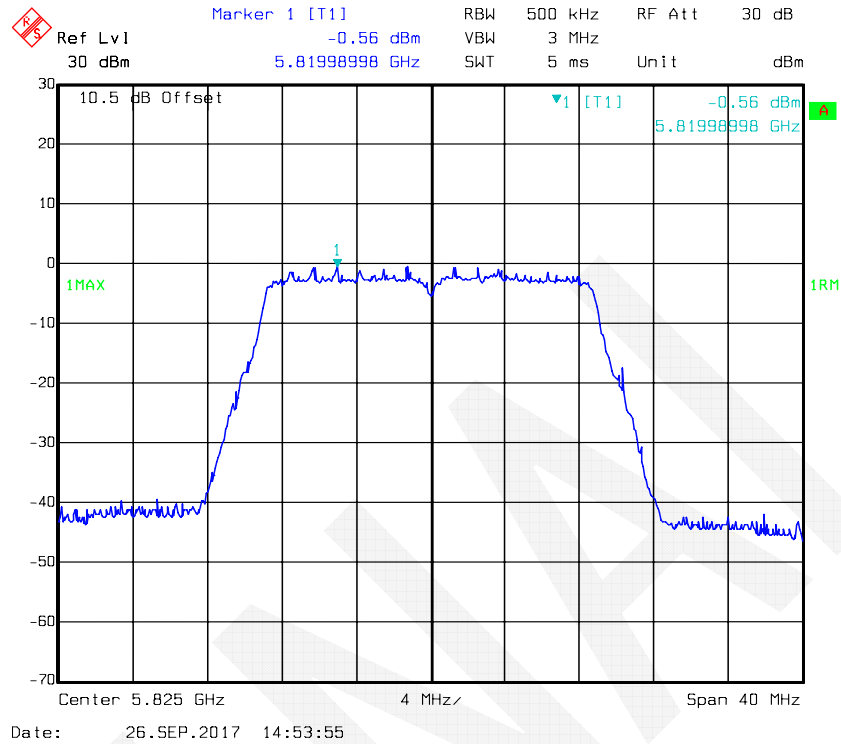
Date: 26.SEP.2017 14:50:39

802.11ac20 mode, Power Spectral Density-5785 MHz, Antenna 0

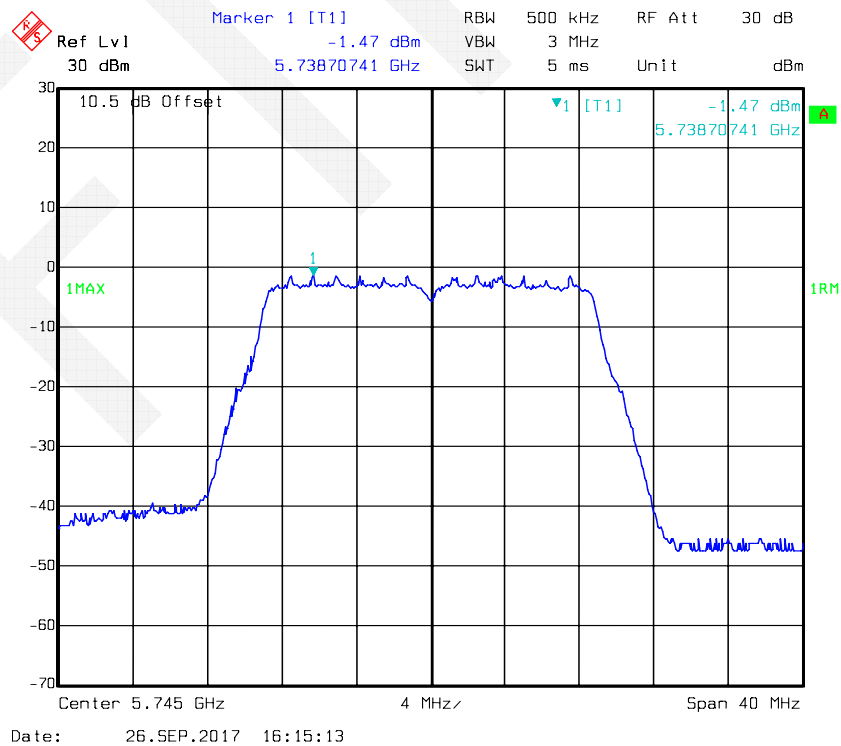


Date: 26.SEP.2017 14:51:28

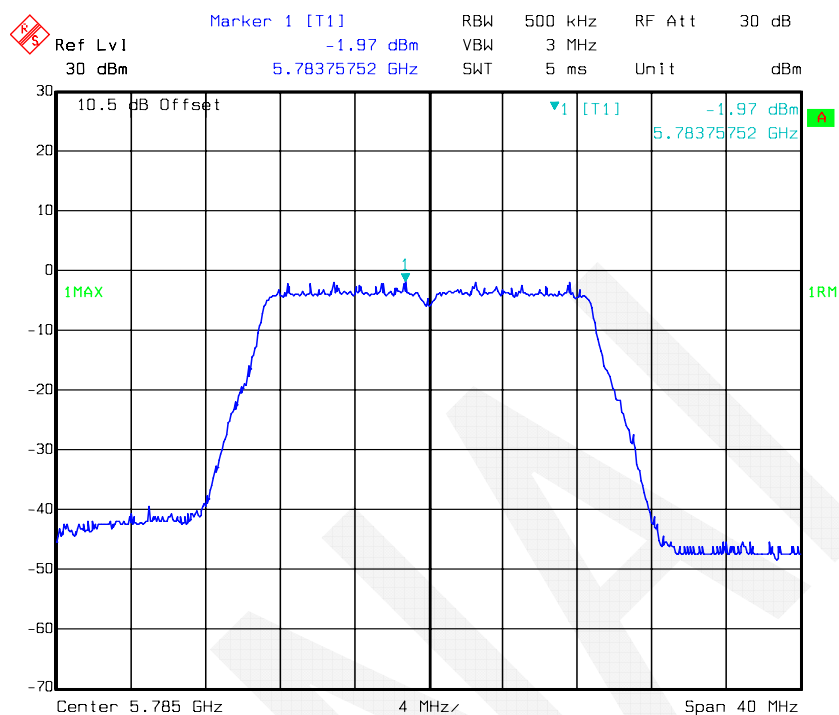
802.11ac20 mode, Power Spectral Density-5825 MHz, Antenna 0



802.11ac20 mode, Power Spectral Density-5745 MHz, Antenna 1

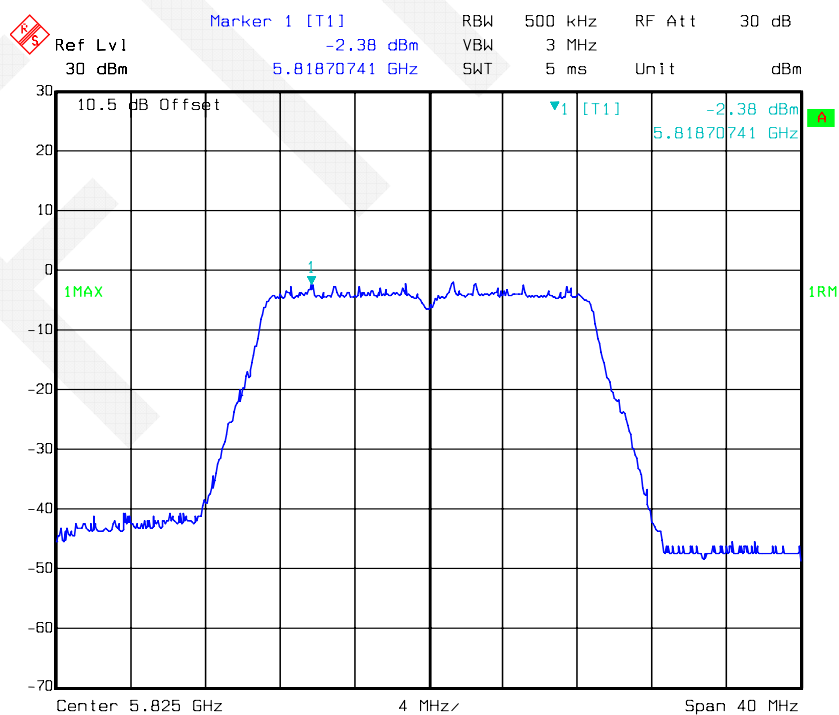


802.11ac20 mode, Power Spectral Density-5785 MHz, Antenna 1



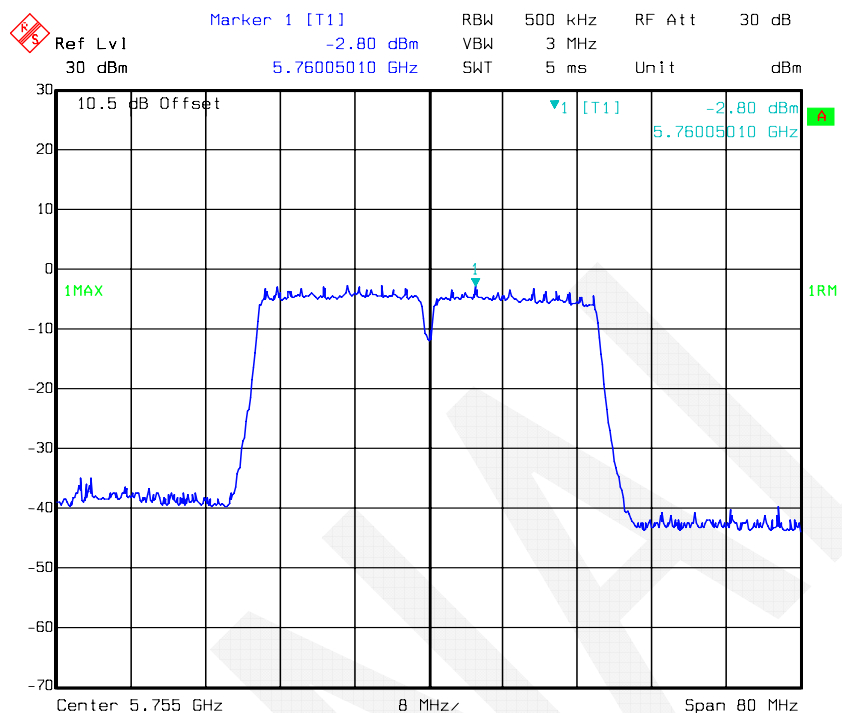
Date: 26.SEP.2017 16:15:50

802.11ac20 mode, Power Spectral Density-5825 MHz, Antenna 1



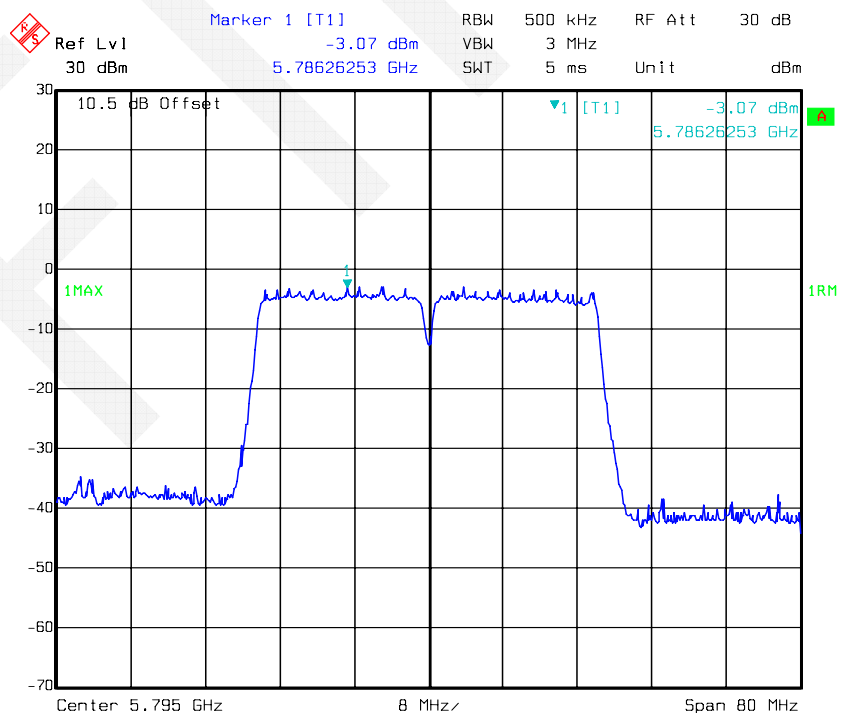
Date: 26.SEP.2017 16:16:21

802.11ac40 mode, Power Spectral Density-5755 MHz, Antenna 0



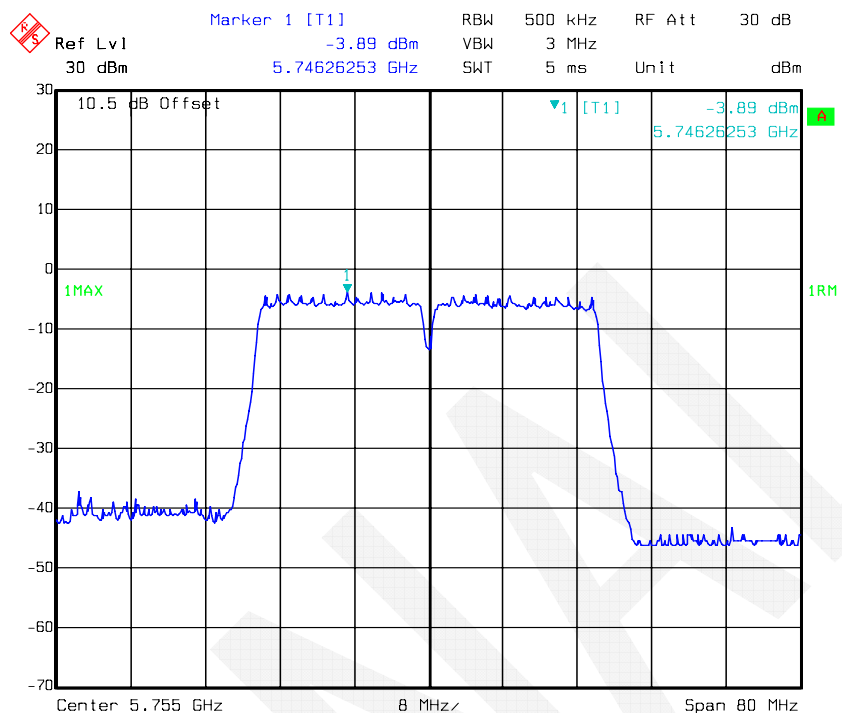
Date: 26.SEP.2017 15:02:36

802.11ac40 mode, Power Spectral Density-5795 MHz, Antenna 0



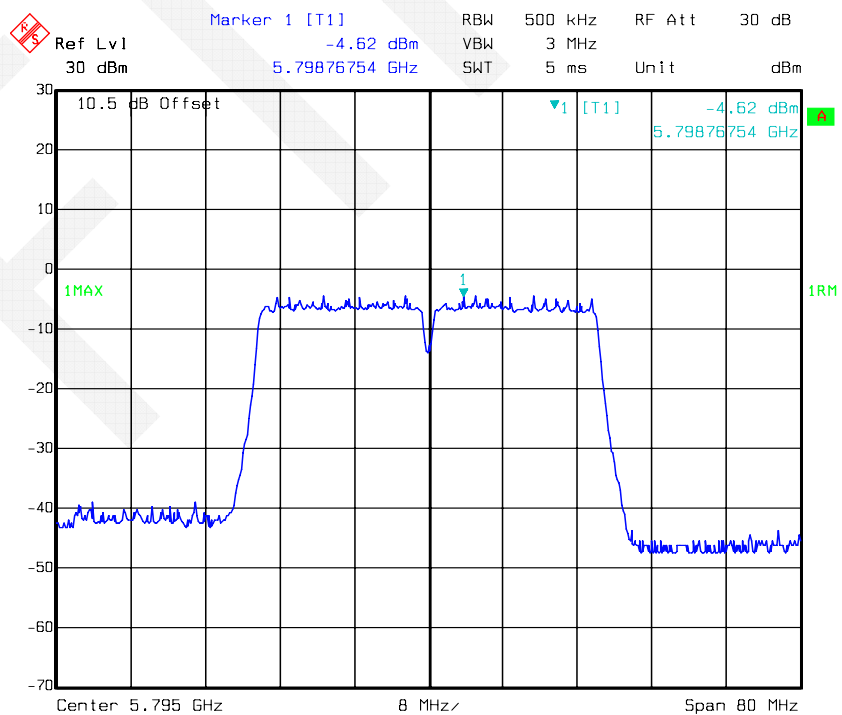
Date: 26.SEP.2017 15:03:13

802.11ac40 mode, Power Spectral Density-5755 MHz, Antenna 1



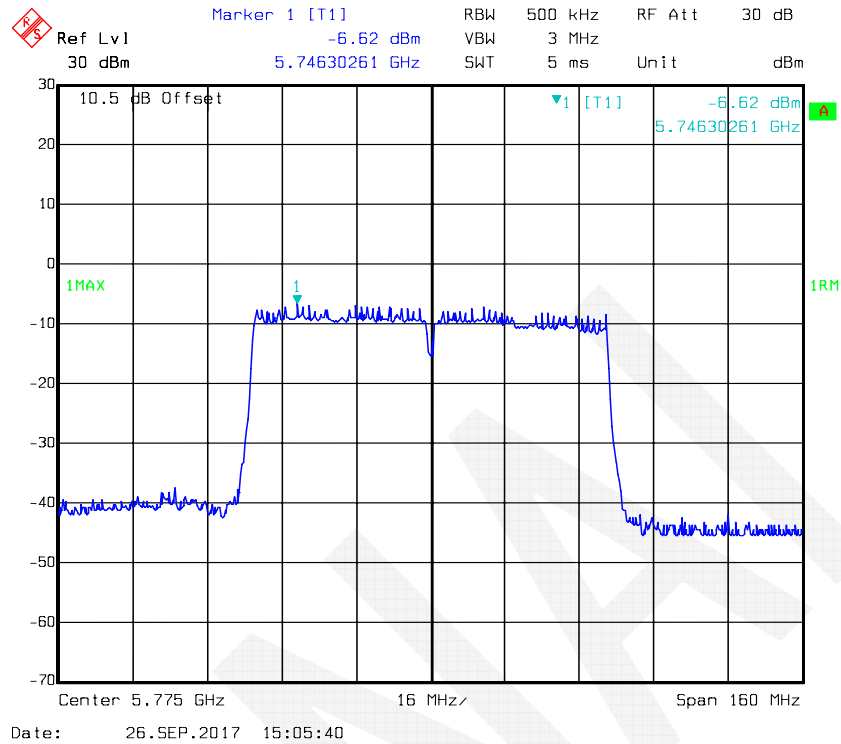
Date: 26.SEP.2017 16:13:15

802.11ac40 mode, Power Spectral Density-5795 MHz, Antenna 1

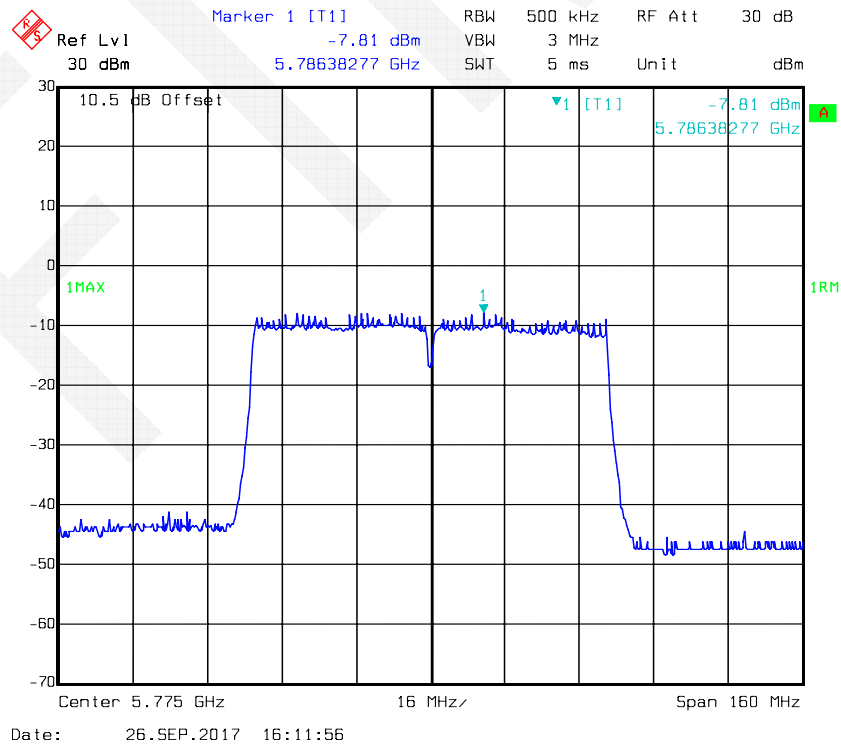


Date: 26.SEP.2017 16:13:56

802.11ac80 mode, Power Spectral Density-5775 MHz, Antenna 0



802.11ac80 mode, Power Spectral Density-5775 MHz, Antenna 1



***** END OF REPORT *****