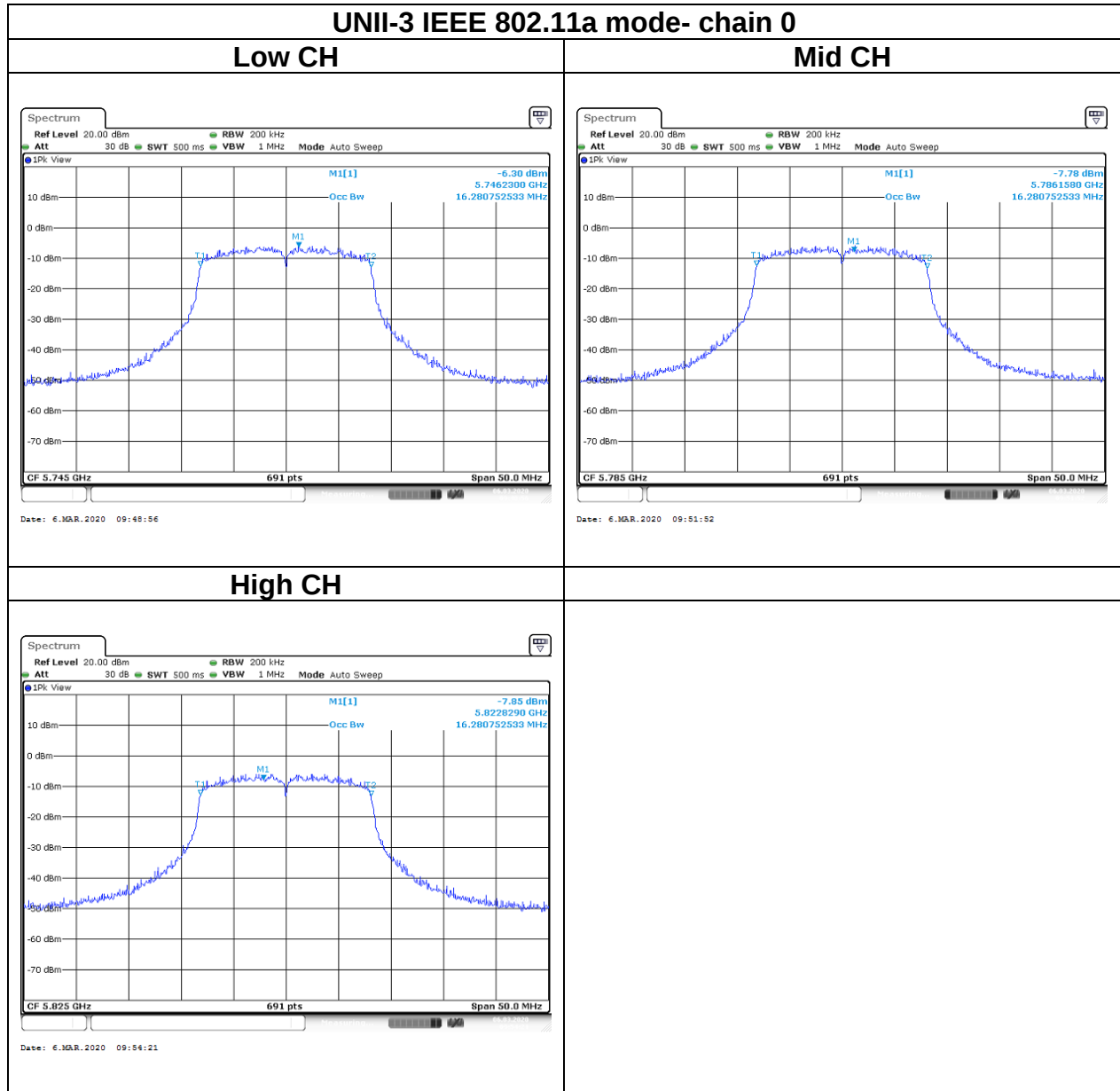
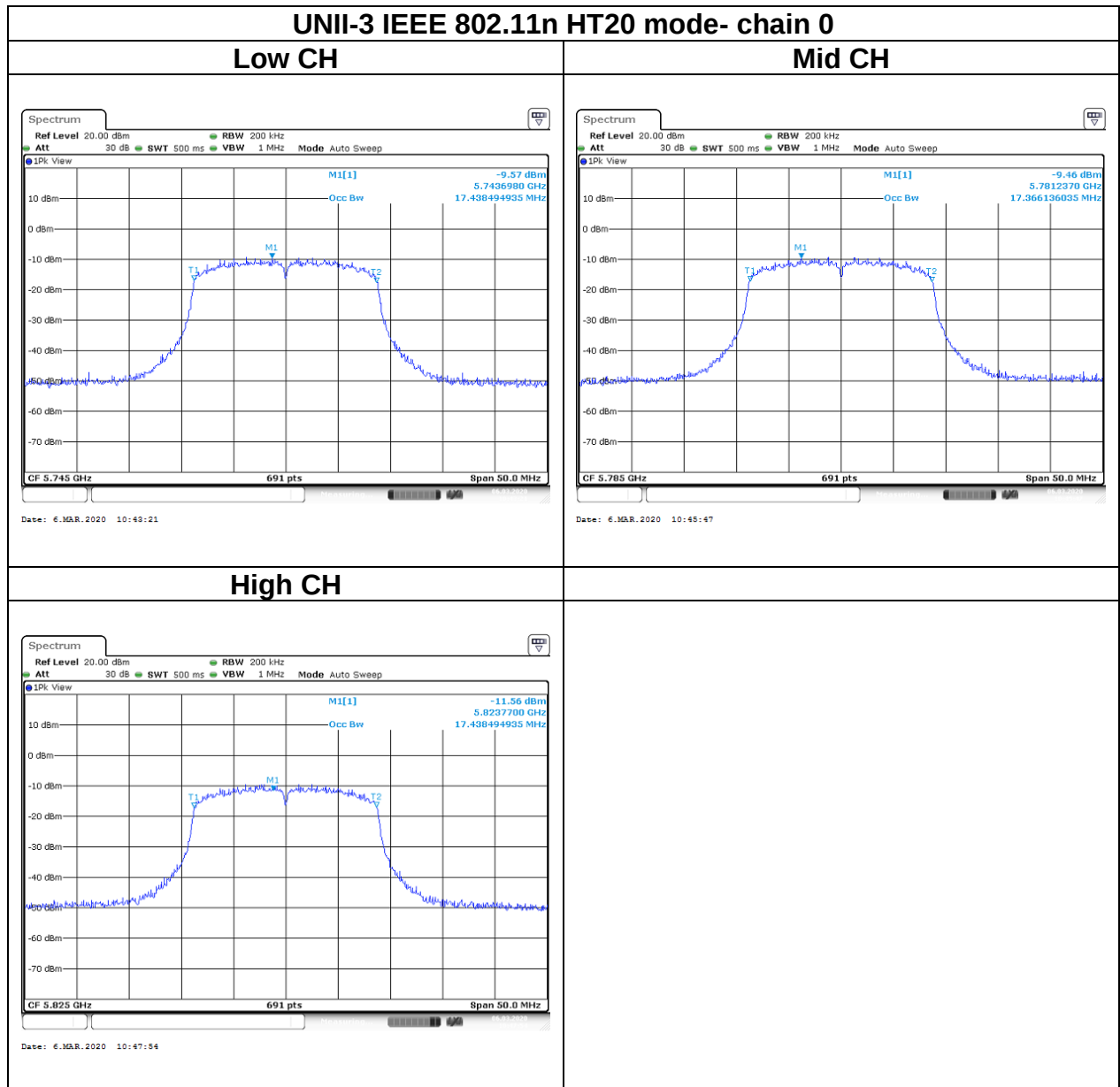
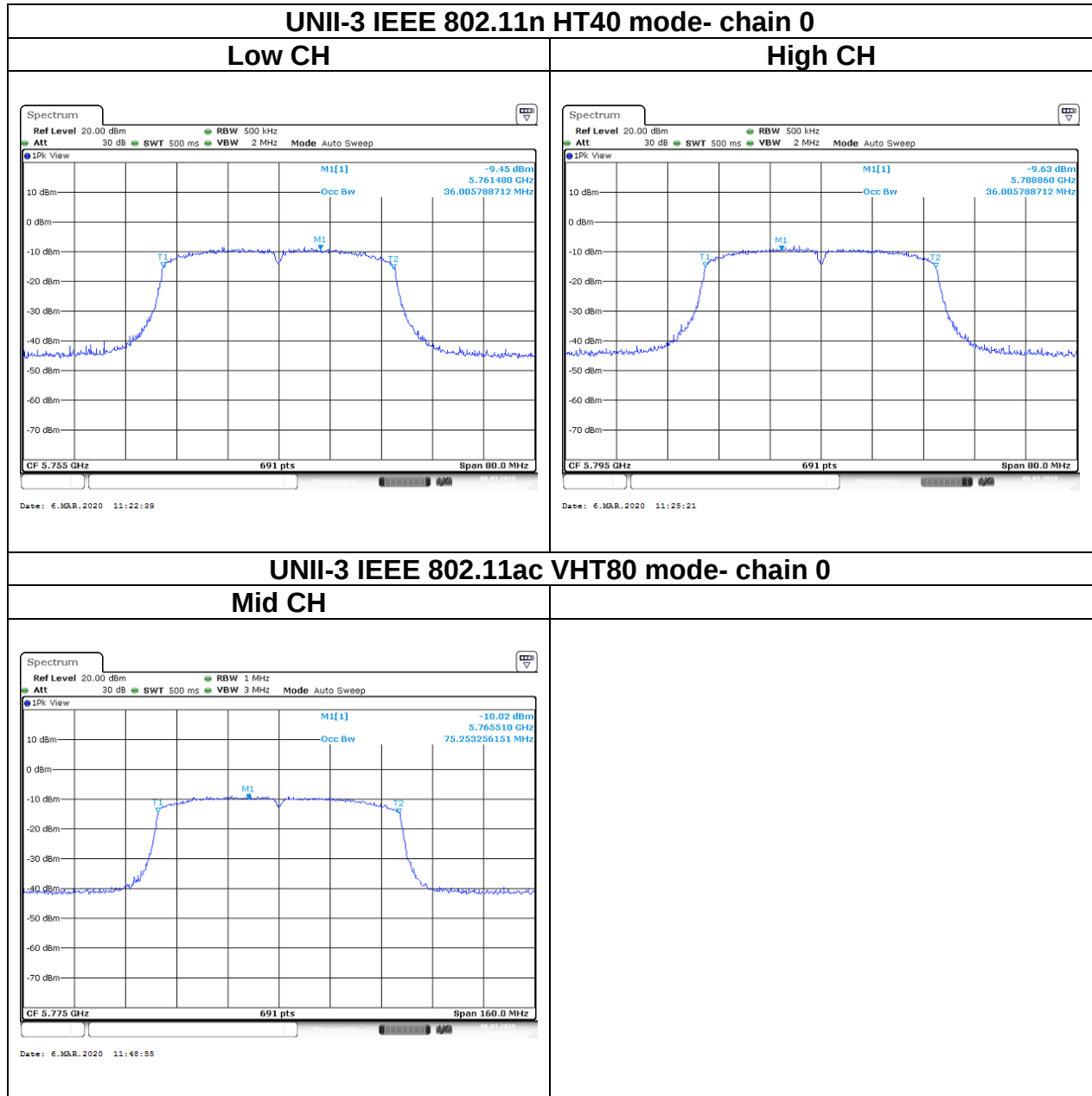


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Test Data (BANDWIDTH 99%)

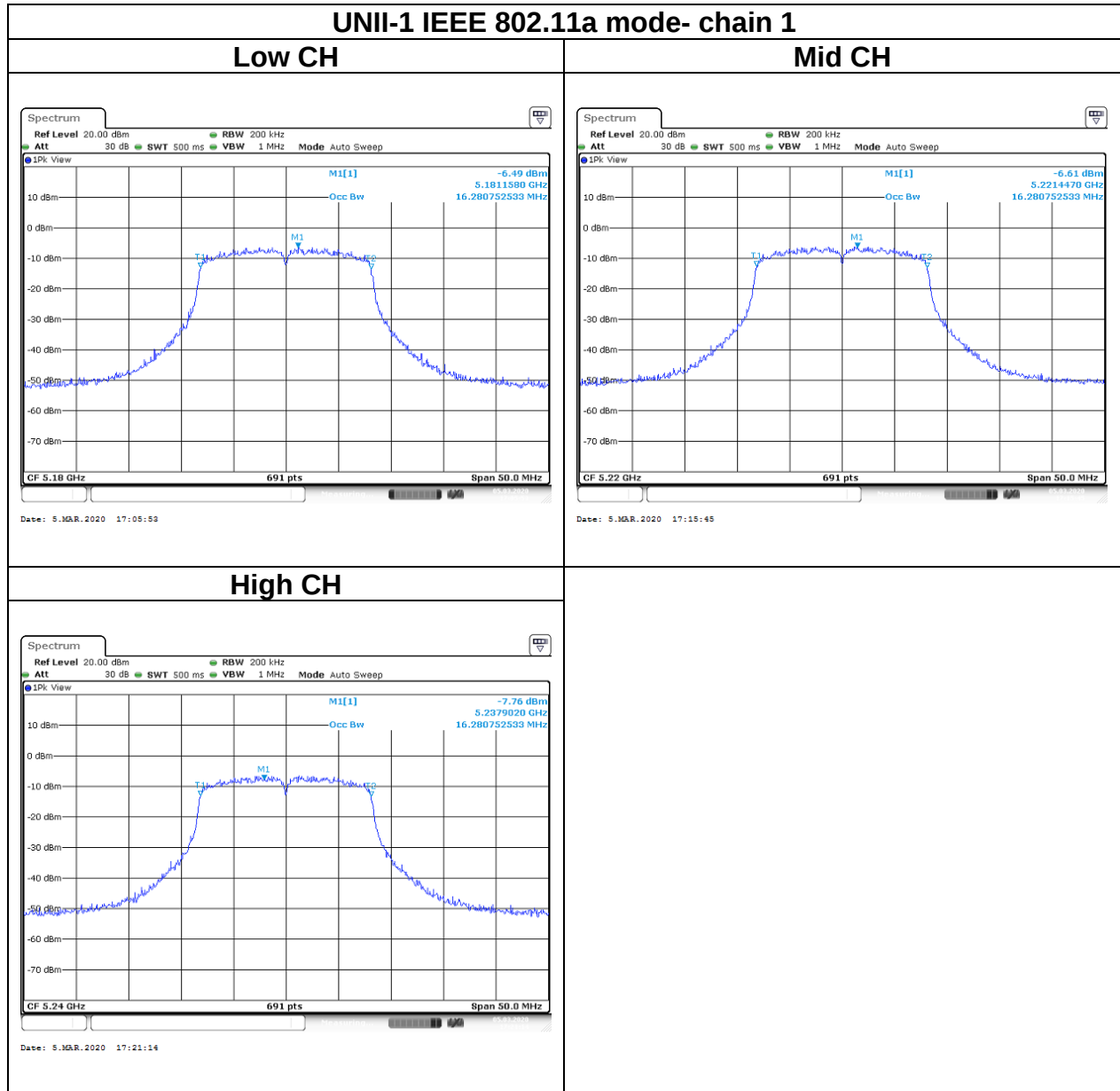


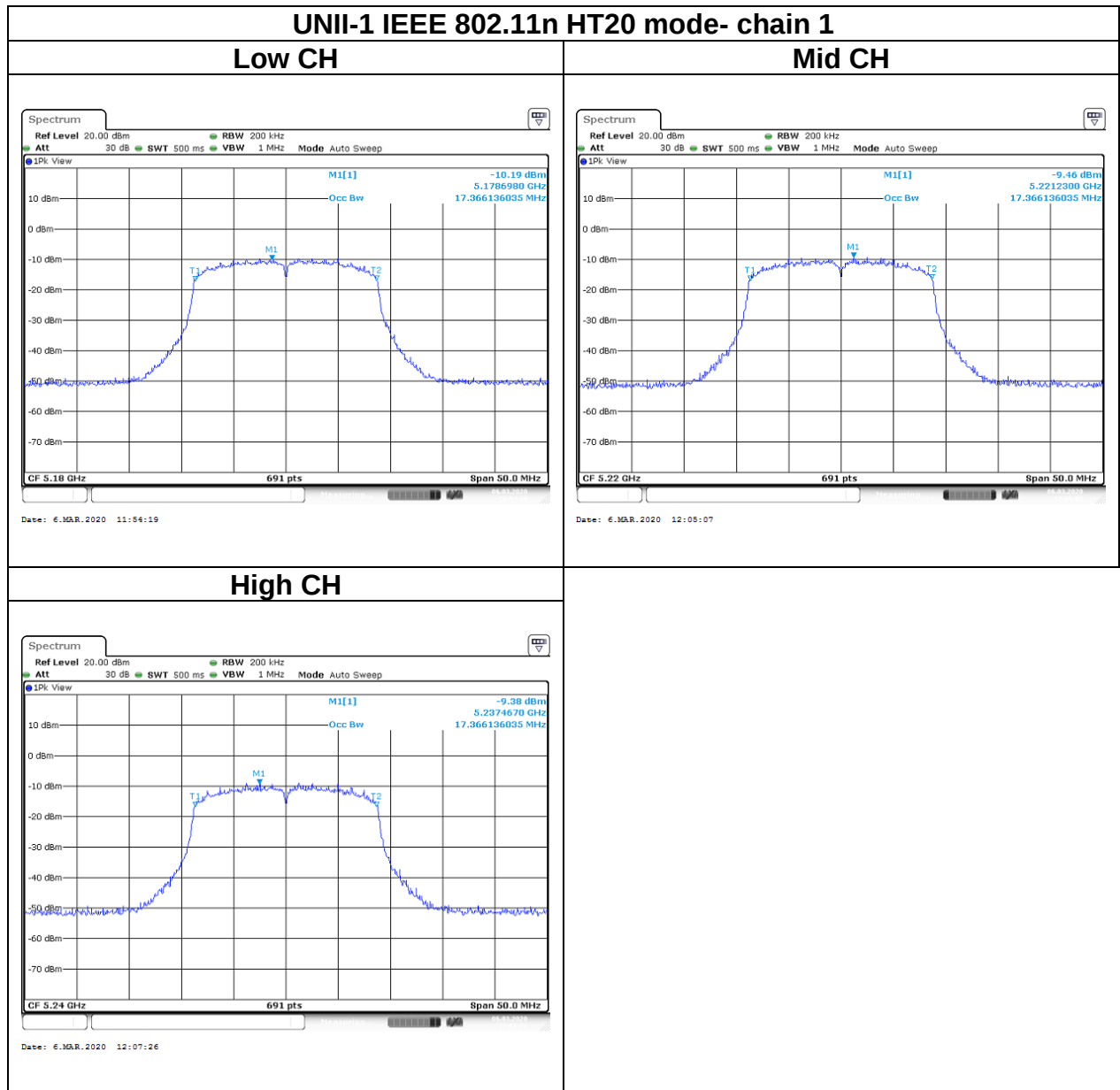


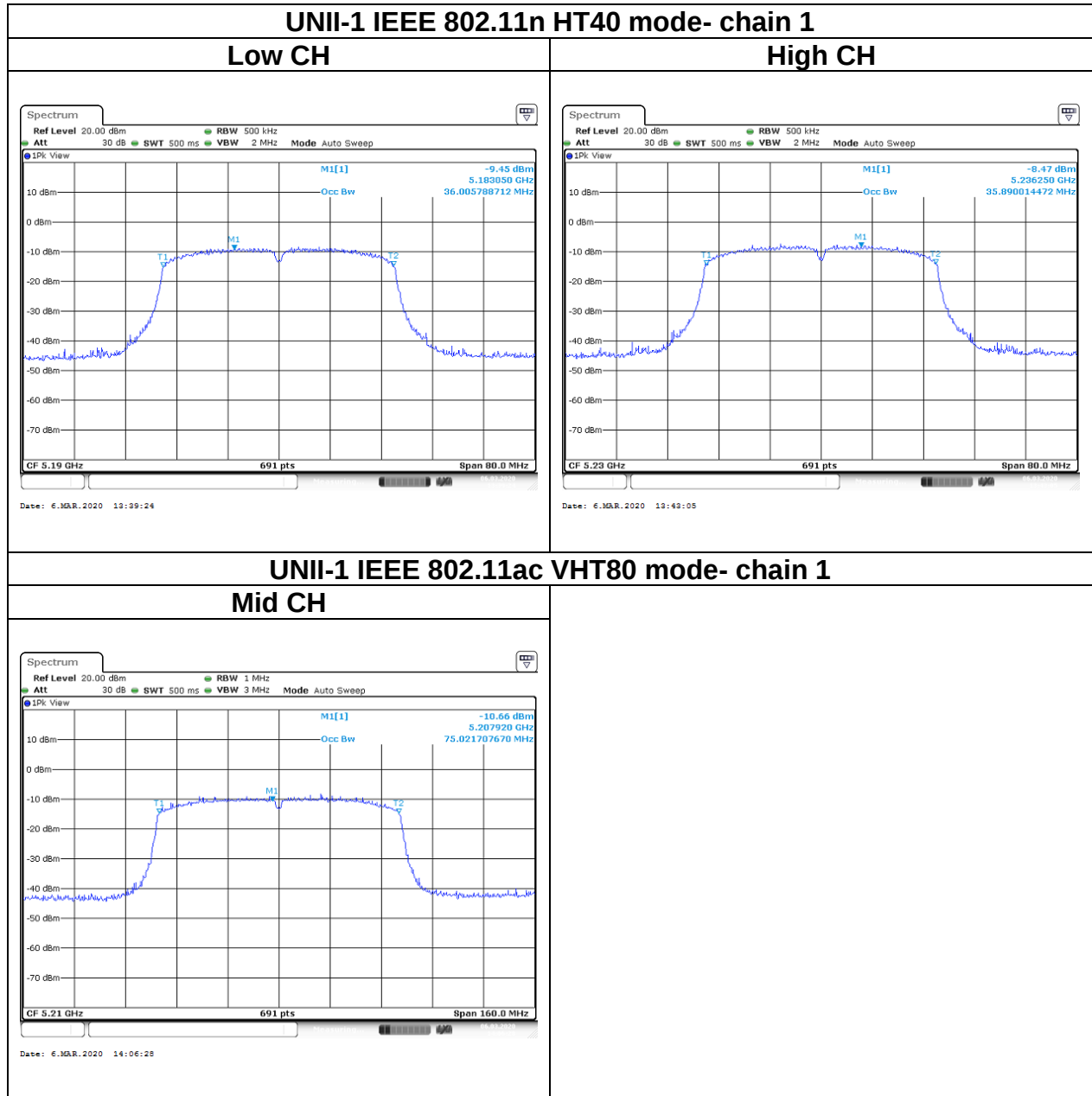


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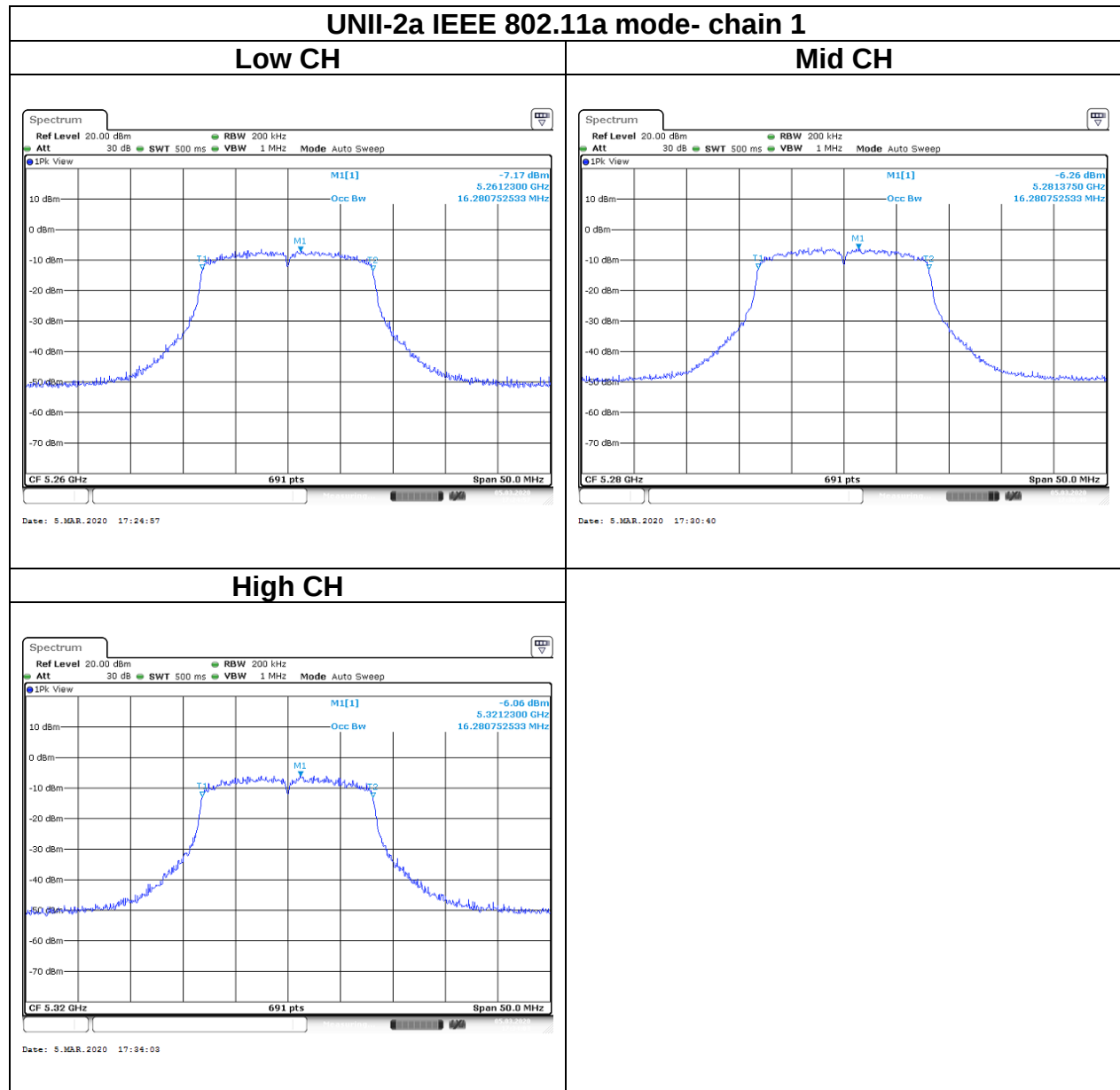


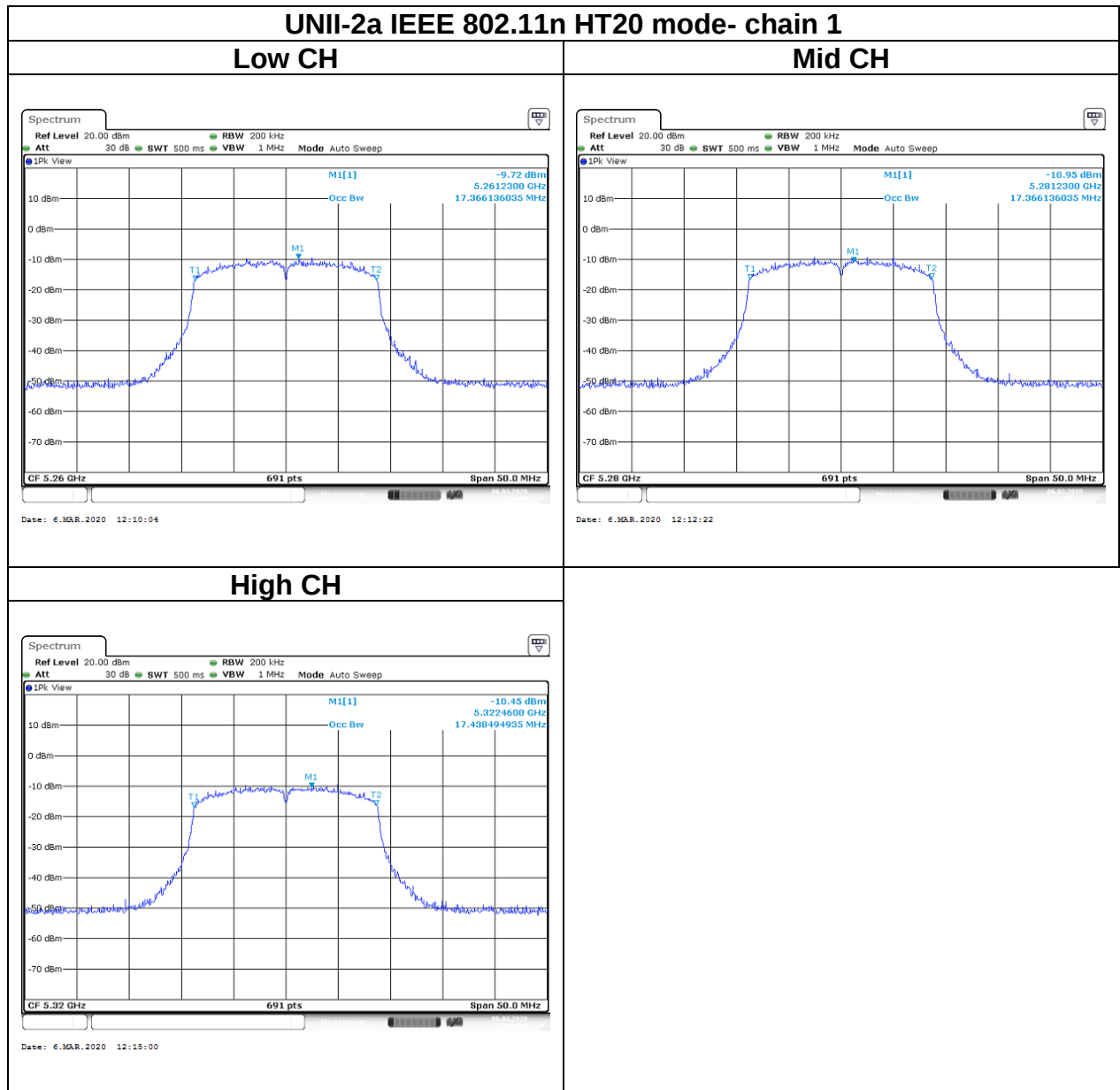
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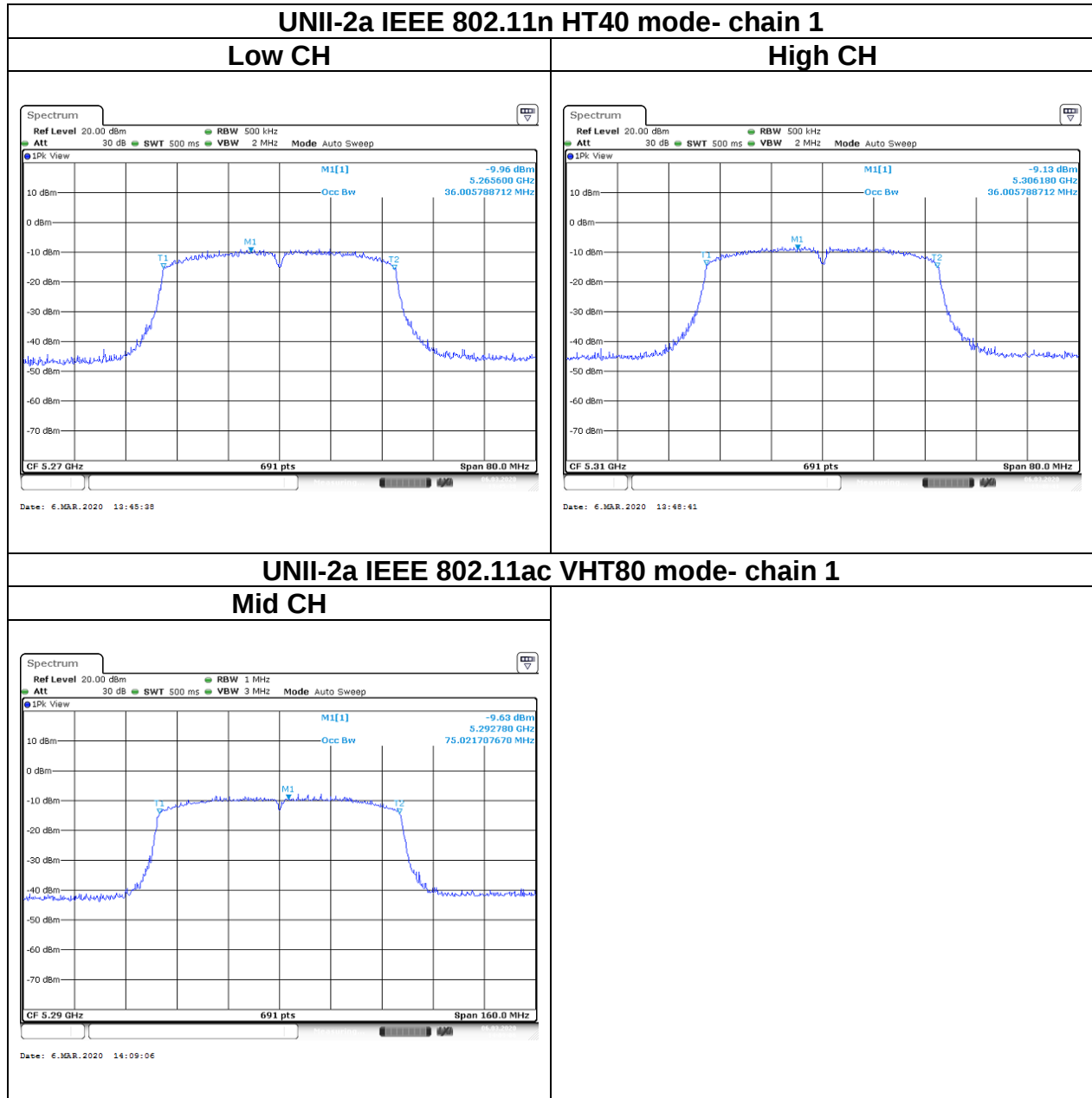
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Test Data (BANDWIDTH 99%)

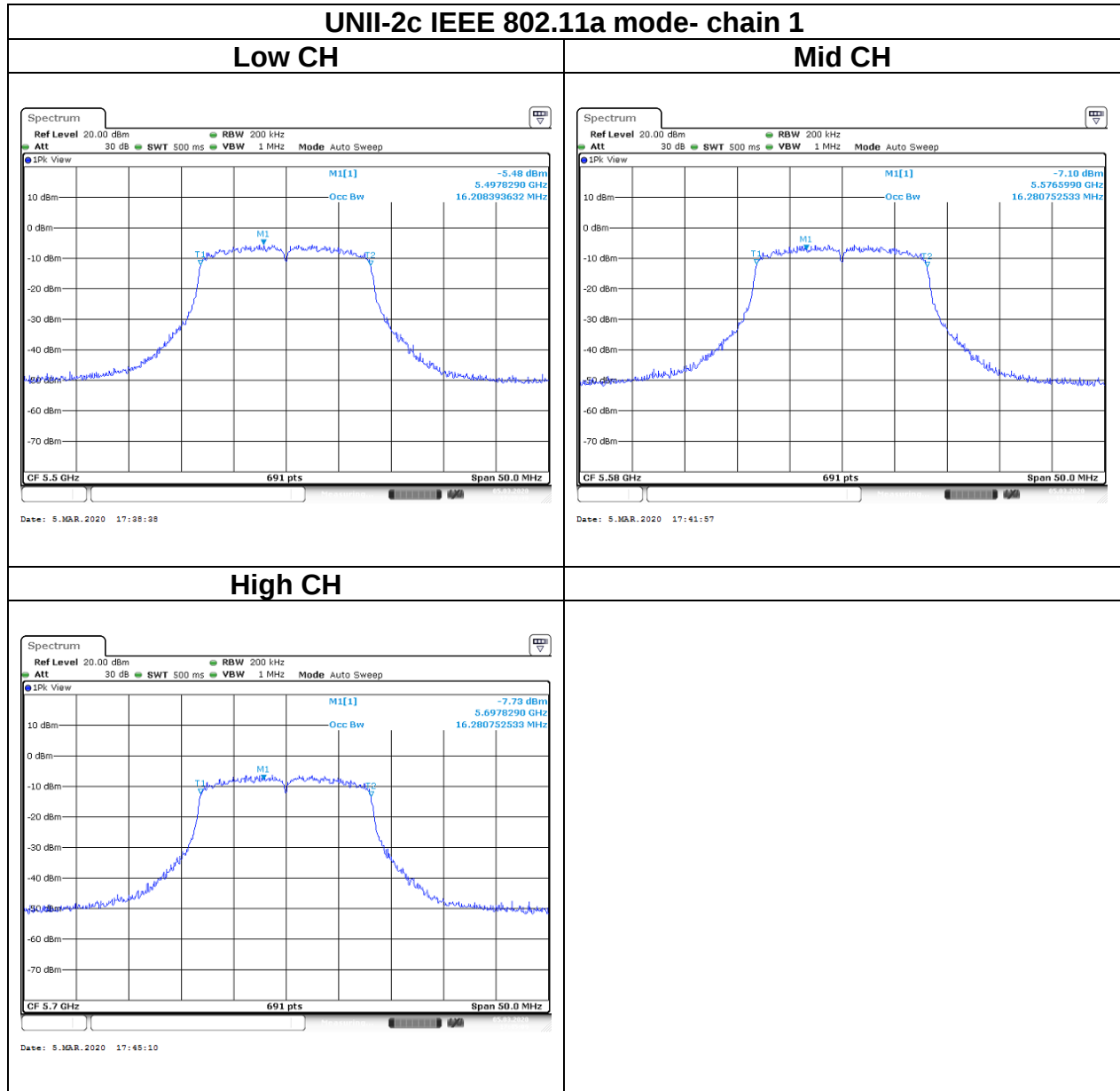


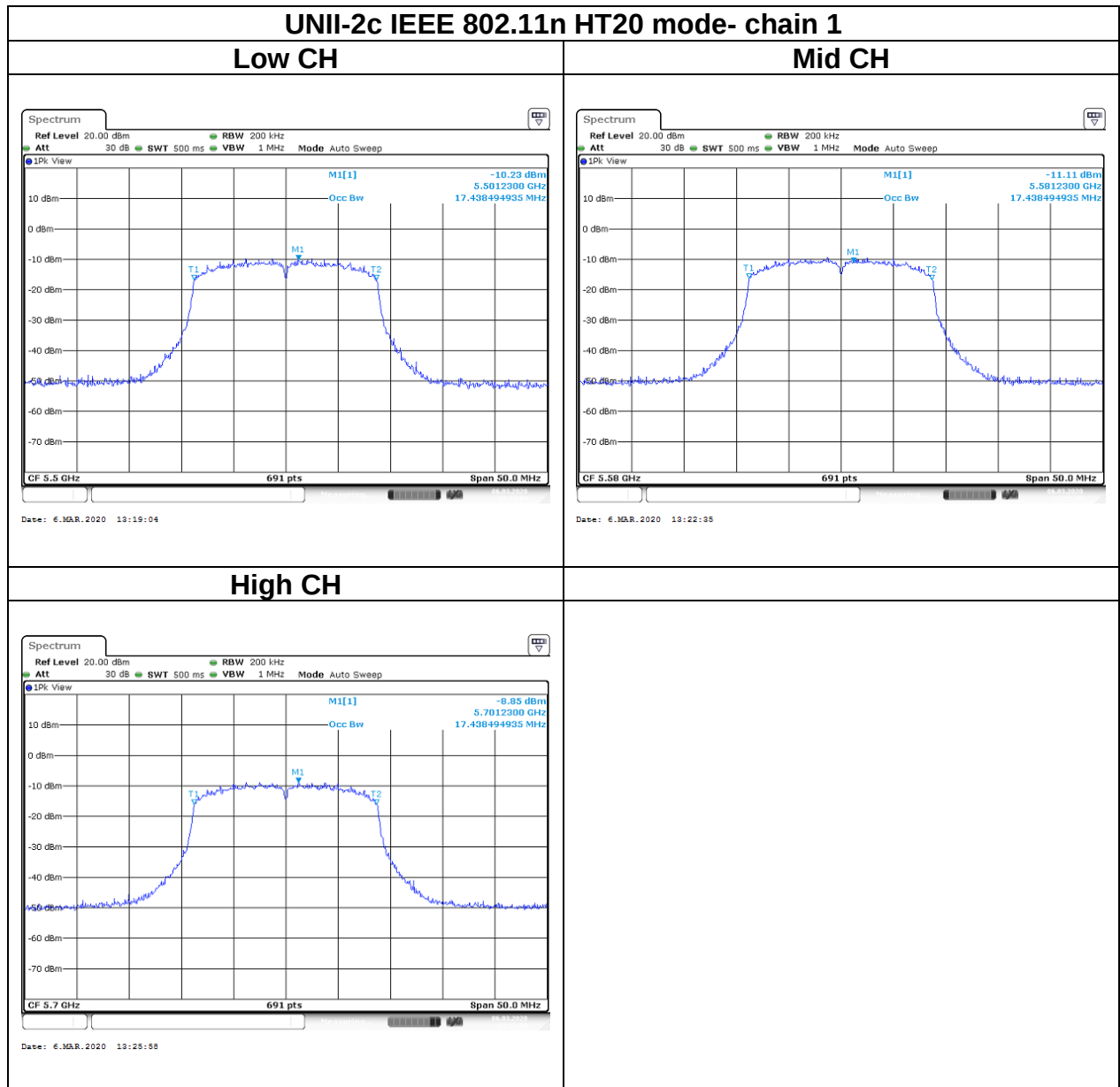


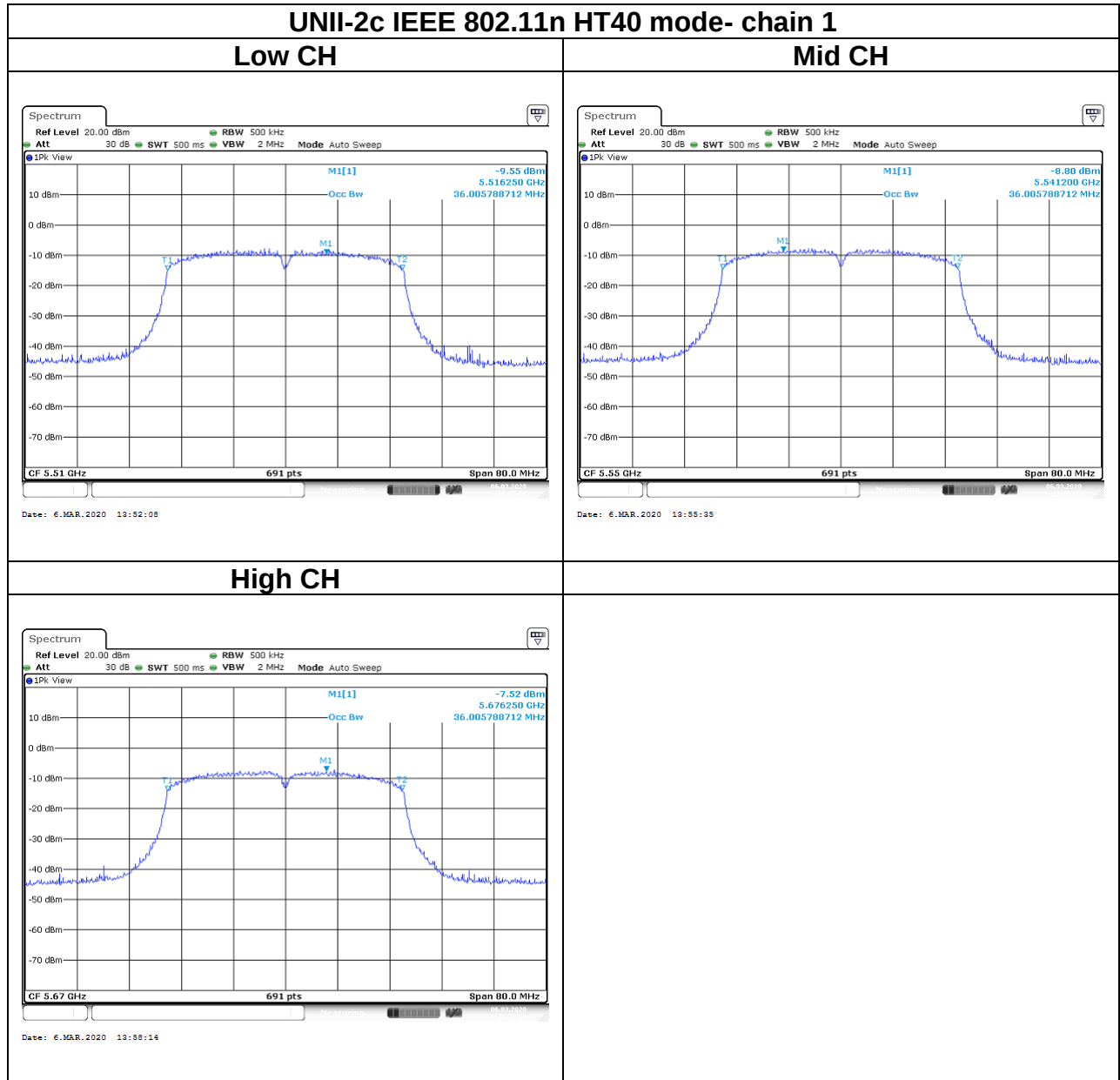


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Test Data (BANDWIDTH 99%)





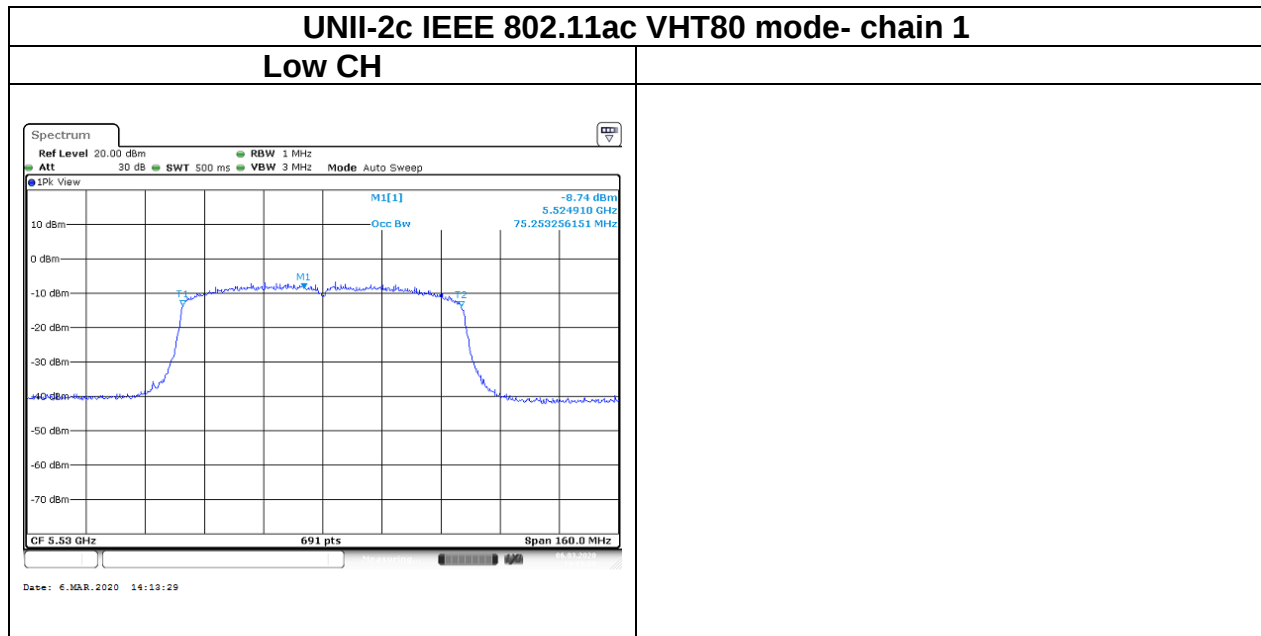




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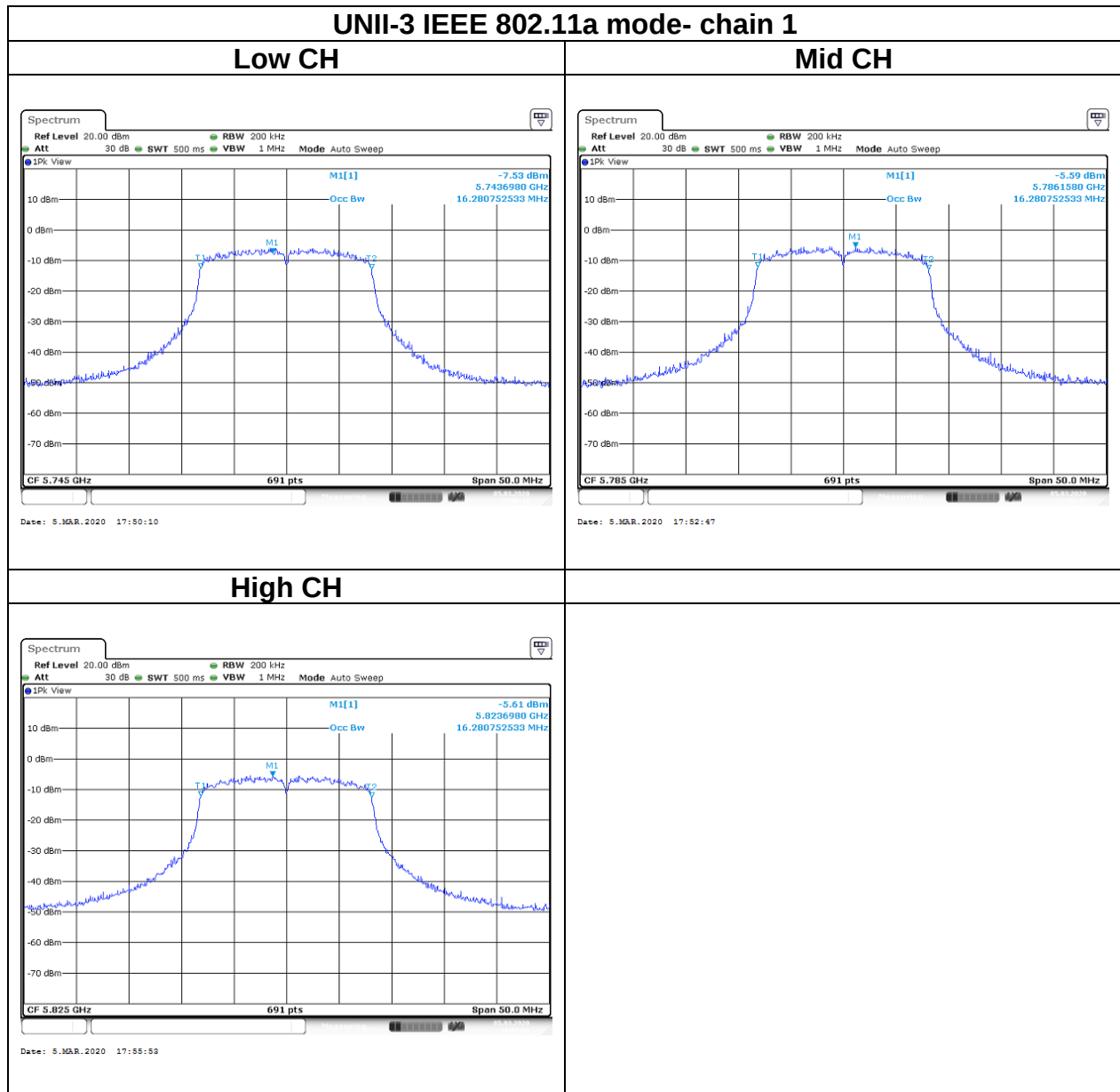
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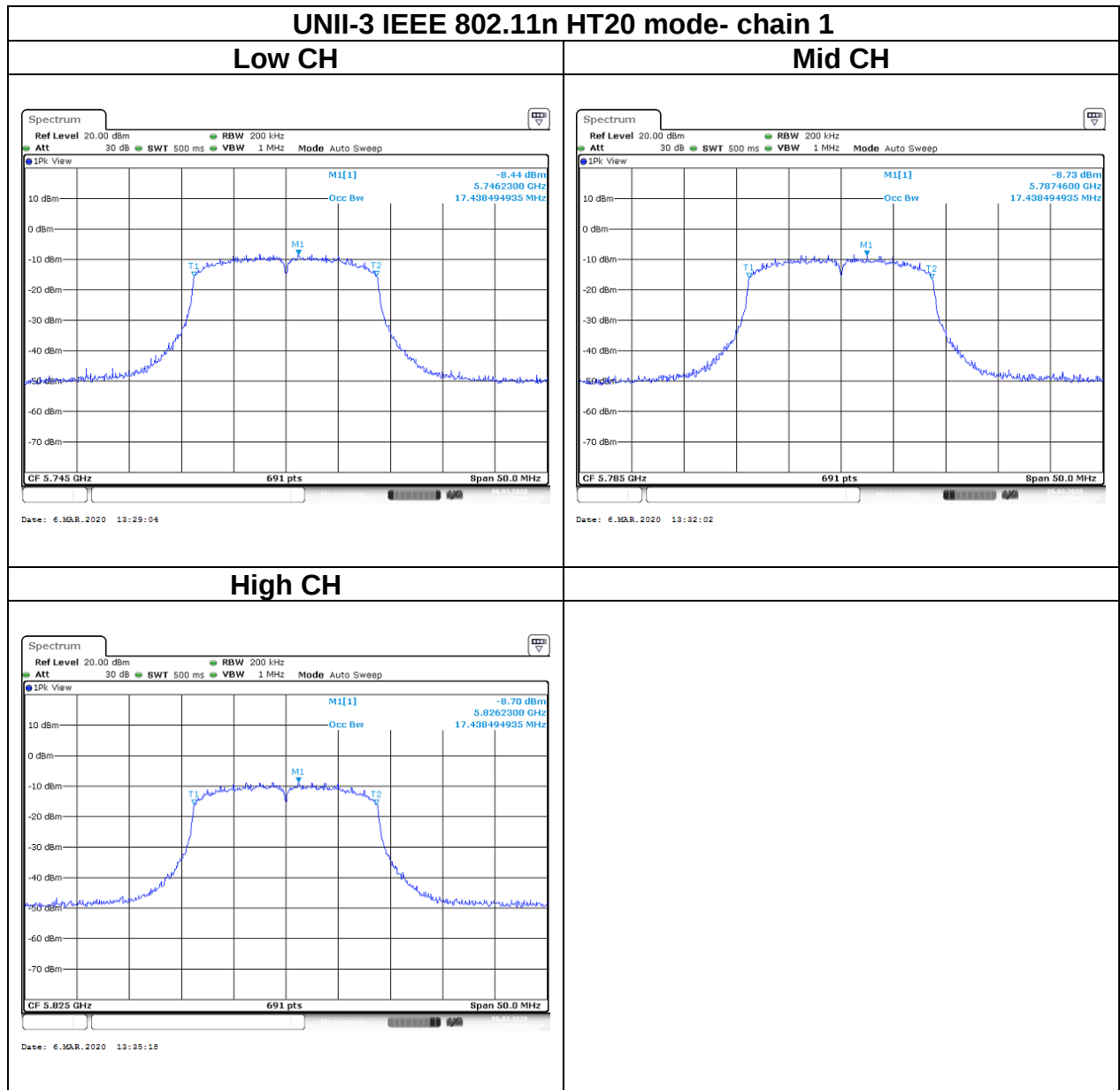
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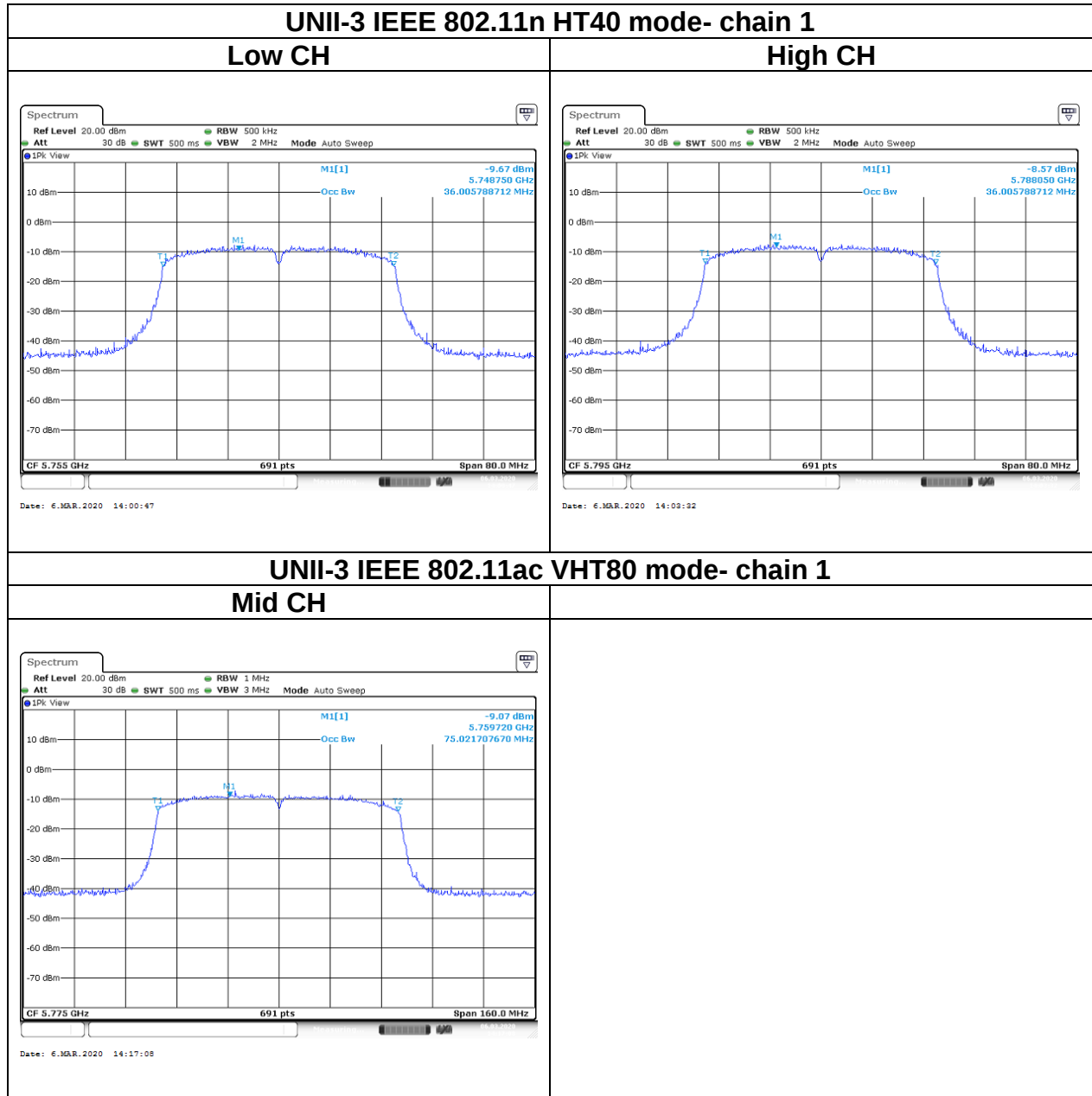


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Test Data (BANDWIDTH 99%)







4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3),

UNII-1 :

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 (24 dBm), whichever power is less. B is the 99% emission bandwidth in megahertz, 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.

UNII-2a and 2c:

the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, 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. and The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log_{10} B$, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. 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.

UNII-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.

UNII-1 Limit	☒ Antenna not exceed 6 dBi : 24dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 24 – (DG – 6)]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi : 24dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 24 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi : 30dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)]

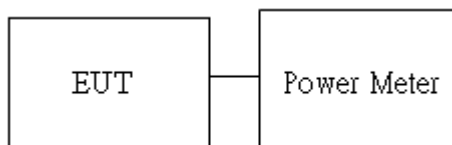
4.3.2 Test Procedure

Test method Refer as KDB 789033 D02, Section E.3.b for BW 20MHz and 40MHz, E.2.b for BW 80MHz.

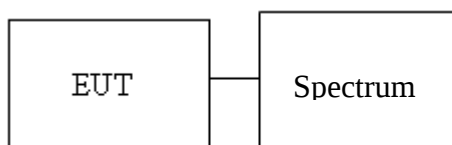
1. The EUT RF output connected to the power meter or spectrum by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Average output power. in the test report.

4.3.3 Test Setup

For BW 20MHz and 40MHz



For BW 80MHz





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4.3.4 Test Result

Conducted output power :

Chain 0:

UNII-1							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	36	5180	17.5	16.93	0.0493	2.22	24
	44	5220	17.5	17.06	0.0508		
	48	5240	17.5	17.07	0.0509		

Chain 1:

UNII-1							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	36	5180	18.0	17.04	0.0506	3.37	24
	44	5220	18.0	17.20	0.0525		
	48	5240	18.0	17.19	0.0523		



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UNII-1										
Config	CH	Freq. (MHz)	Power Set		AV Power (dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			Chain 0	Chain 1	Chain 0	Chain 1				
IEEE 802.11n HT20 Data rate: MCS8	36	5180	14.5	14.5	14.09	13.75	16.93	0.0493	1.69	24
	44	5220	14.0	14.0	13.61	13.45	16.54	0.0451		
	48	5240	14.0	14.0	13.60	13.60	16.61	0.0458		
IEEE 802.11n HT40 Data rate: MCS8	38	5190	14.5	14.5	13.95	13.98	16.98	0.0499		
	46	5230	14.5	14.5	14.13	13.97	17.06	0.0508		
IEEE 802.11ac VHT80 Data rate: MCS8	42	5210	13.5	13.5	12.96	12.76	15.87	0.0386		



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Chain 0:

UNII-2a							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	52	5260	17.5	17.05	0.0507	2.22	24
	56	5280	17.5	16.94	0.0494		
	64	5320	17.5	16.95	0.0495		

Chain 1:

UNII-2a							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	52	5260	17.5	16.78	0.0476	3.37	24
	56	5280	17.5	17.21	0.0526		
	64	5320	18.0	17.21	0.0526		



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UNII-2a										
Config	CH	Freq. (MHz)	Power Set		AV Power (dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			Chain 0	Chain 1	Chain 0	Chain 1				
IEEE 802.11n HT20 Data rate: MCS8	52	5260	14.0	14.0	13.58	13.62	16.61	0.0458	1.69	24
	56	5280	14.0	14.0	13.60	13.50	16.56	0.0453		
	64	5320	13.5	13.5	13.12	13.50	16.32	0.0429		
IEEE 802.11n HT40 Data rate: MCS8	54	5270	14.0	14.0	13.75	13.76	16.77	0.0475		
	62	5310	14.5	14.5	14.08	14.19	17.15	0.0518		
IEEE 802.11ac VHT80 Data rate: MCS8	58	5290	13.5	13.5	13.07	13.16	16.12	0.0409		



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Chain 0:

UNII-2c							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	100	5500	17.5	16.95	0.0495	2.22	24
	116	5580	18.0	17.20	0.0525		
	140	5700	18.5	17.21	0.0526		

Chain 1:

UNII-2c							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	100	5500	18.5	16.81	0.0480	3.37	24
	116	5580	18.5	17.19	0.0523		
	140	5700	17.0	14.24	0.0265		



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UNII-2c										
Config	CH	Freq. (MHz)	Power Set		AV Power (dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			Chain 0	Chain 1	Chain 0	Chain 1				
IEEE 802.11n HT20 Data rate: MCS8	100	5500	14.5	14.5	13.99	13.57	16.79	0.0478	2.83	24
	116	5580	14.5	14.5	13.54	13.88	16.72	0.0470		
	140	5700	14.5	14.5	13.27	13.98	16.65	0.0462		
IEEE 802.11n HT40 Data rate: MCS8	102	5510	13.5	13.5	11.03	11.59	14.33	0.0271		
	110	5550	14.5	14.5	13.87	13.65	16.77	0.0475		
	134	5670	15.0	15.0	14.15	13.76	16.97	0.0498		
IEEE 802.11ac VHT80 Data rate: MCS8	106	5530	13.5	13.5	12.76	12.43	15.60	0.0363		



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Chain 0:

UNII-3							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	149	5745	18.5	17.12	0.0515	2.22	30
	157	5785	19.0	17.13	0.0516		
	165	5825	19.0	17.19	0.0523		

Chain 1:

UNII-3							
Config	CH	Freq. (MHz)	Power Set	AV Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
IEEE 802.11a Data rate: 6Mbps	149	5745	18.5	16.86	0.0485	3.37	30
	157	5785	19.0	17.08	0.0510		
	165	5825	19.0	16.87	0.0486		



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UNII-3										
Config	CH	Freq. (MHz)	Power Set		AV Power (dBm)		AV Total Power (dBm)	AV Total Power (W)	DG (dBi)	Limit (dBm)
			Chain 0	Chain 1	Chain 0	Chain 1				
IEEE 802.11n HT20 Data rate: MCS0	149	5745	15.0	15.0	13.34	14.12	16.76	0.0474	1.62	30
	157	5785	15.0	15.0	13.30	14.06	16.71	0.0468		
	165	5825	15.0	15.0	13.42	13.73	16.59	0.0456		
IEEE 802.11n HT40 Data rate: MCS0	151	5755	15.0	15.0	13.13	14.27	16.75	0.0473		
	159	5795	15.0	15.0	13.47	13.93	16.72	0.0470		
IEEE 802.11ac VHT80 Data rate: MCS0	155	5775	14.0	14.0	12.80	13.04	15.93	0.0391		

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.407 (a)(1), 15.407(a)(2) and 15.407(a)(3)

UNII-1 :

The maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

UNII-2a and 2c:

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.

UNII-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.

UNII-1 Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-2a Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-2c Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-3 Limit	☒ Antenna not exceed 6 dBi : 30 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 30 – (DG – 6)]

4.4.2 Test Procedure

Test method Refer as KDB 789033 D02

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. UNII-1, UNII-2a and UNII-2c, SA set RBW = 1MHz, VBW = 3MHz and Detector = RMS, to measurement Power Density.
4. UNII-3, SA set RBW = 500kHz, VBW = 2MHz and Detector = RMS, to measurement Power Density
5. The path loss and Duty Factor were compensated to the results for each measurement by SA.
6. Mark the maximum level.
7. Measure and record the result of power spectral density. in the test report.

4.4.3 Test Setup



4.4.4 Test Result

UNII-1 5150-5250 MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5180	3.01	2.77	-	11
Mid	5220	3.08	2.94	-	
High	5240	3.16	3.11	-	

Test mode: IEEE 802.11n HT20 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5180	-0.61	-0.41	2.50	11
Mid	5220	-0.38	-0.21	2.72	
High	5240	0.27	-0.2	3.05	
Test mode: IEEE 802.11n HT40 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5190	-3.82	-3.53	-0.66	11
High	5230	-3.68	-3.39	-0.52	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Mid	5210	-7.81	-7.56	-4.67	11

UNII-2a 5250-5350 MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	Total PPSP (dBm)	Limit (dBm)
Low	5260	3.15	2.72	-	11
Mid	5280	3.24	2.75	-	
High	5320	3.48	3.34	-	

Test mode: IEEE 802.11n HT20 mode					
Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	Total PPSP (dBm)	Limit (dBm)
Low	5260	-0.21	-0.58	2.62	11
Mid	5280	-0.16	-0.4	2.73	
High	5320	0.04	-0.29	2.89	

Test mode: IEEE 802.11n HT40 mode					
Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	Total PPSP (dBm)	Limit (dBm)
Low	5270	-3.39	-3.61	-0.49	11
High	5310	-3.13	-2.92	-0.01	

Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSP (dBm)	Chain 1 PPSP (dBm)	Total PPSP (dBm)	Limit (dBm)
Mid	5290	-6.86	-7.07	-3.95	11

UNII-2c 5470-5725 MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5500	3.66	3.53	-	11
Mid	5580	3.02	3.45	-	
High	5700	3.73	3.01	-	

Test mode: IEEE 802.11n HT20 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5500	0.26	-0.29	3.00	11
Mid	5580	-0.12	0.12	3.01	
High	5700	-0.49	0.11	2.83	

Test mode: IEEE 802.11n HT40 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5510	-2.38	-3.11	0.28	11
Mid	5550	-2.59	-3.11	0.17	
High	5670	-2.87	-2.91	0.12	

Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5530	-6.53	-7.13	-3.81	11

UNII-3 5725-5825 MHz					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5745	9.02	9.7	-	30
Mid	5785	8.8	9.9	-	
High	5825	9.44	9.61	-	

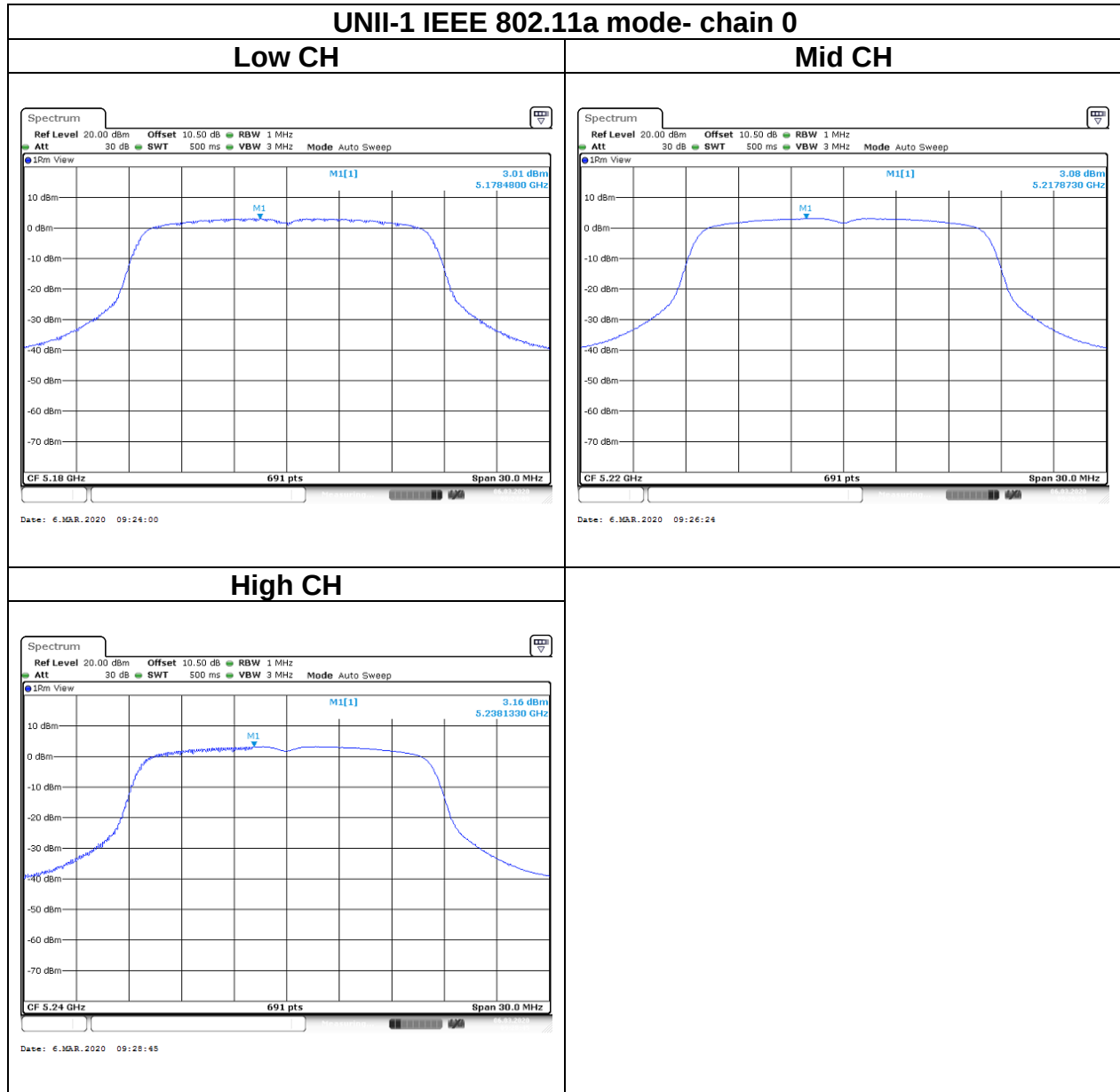
Test mode: IEEE 802.11n HT20 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5745	5.79	6.77	9.32	30
Mid	5785	5.1	6.45	8.84	
High	5825	5.59	5.85	8.73	

Test mode: IEEE 802.11n HT40 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5755	2.45	3.46	5.99	30
High	5795	2.03	3.07	5.59	

Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Mid	5775	-2	-0.66	1.73	30

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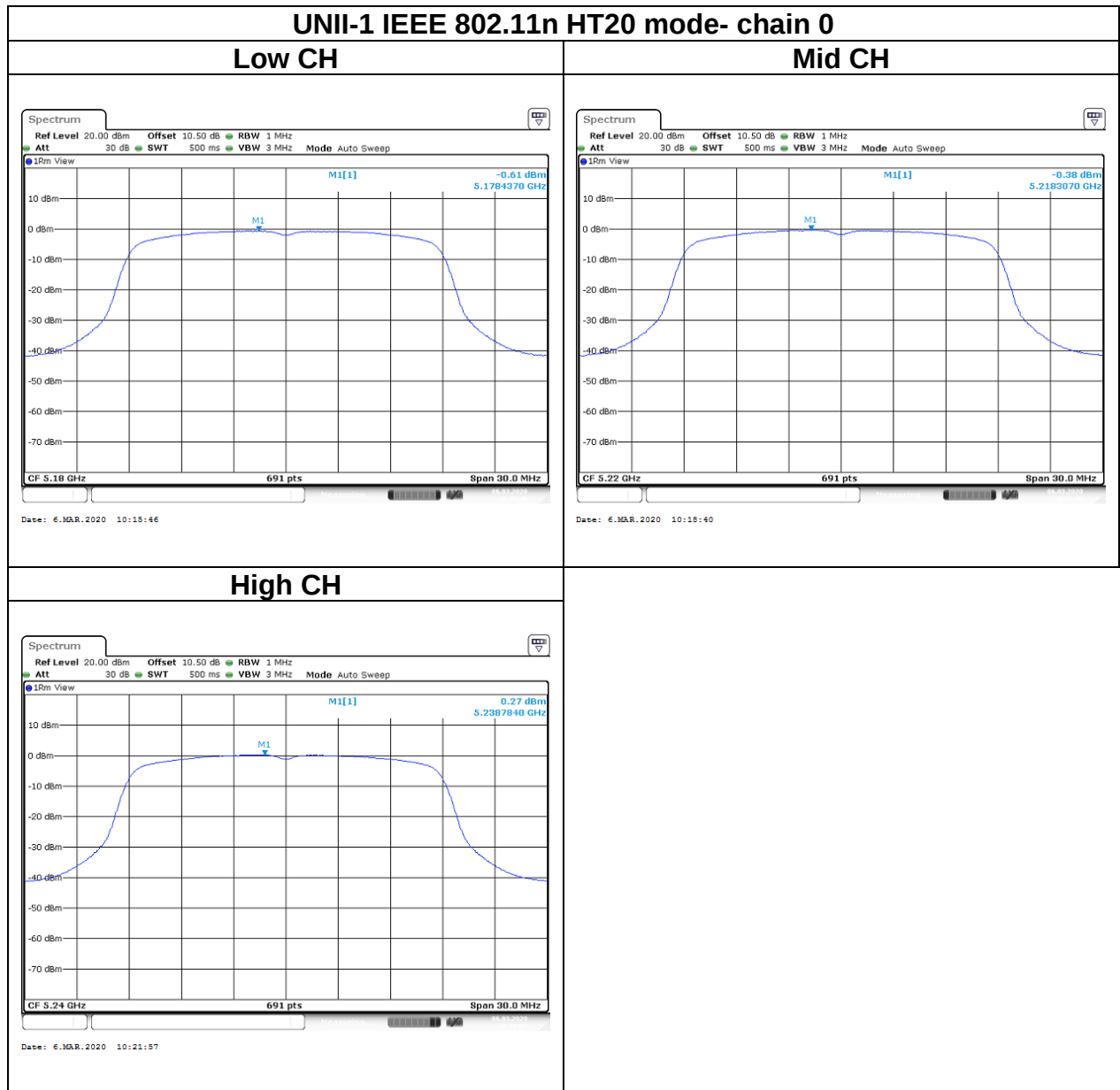


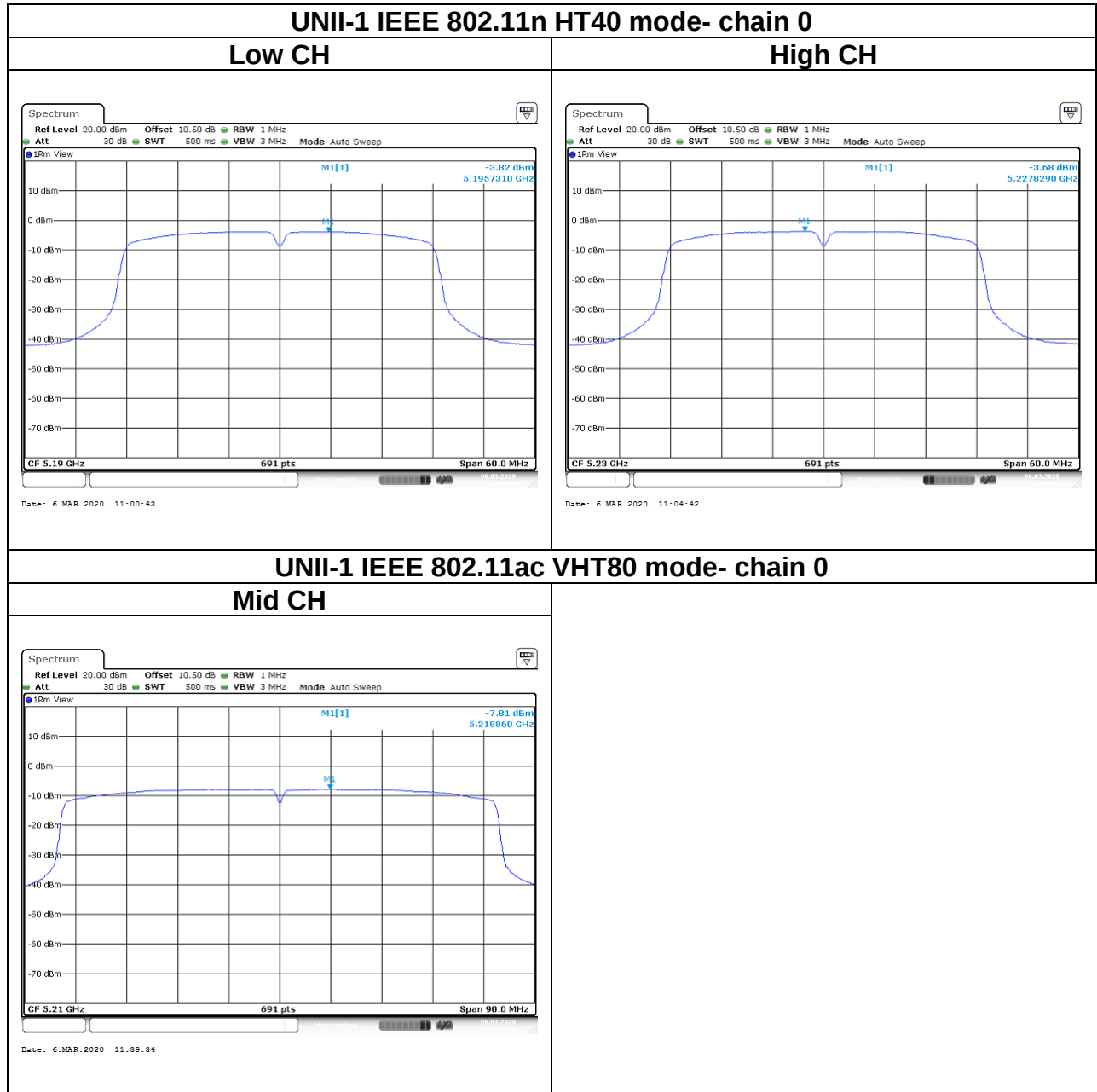


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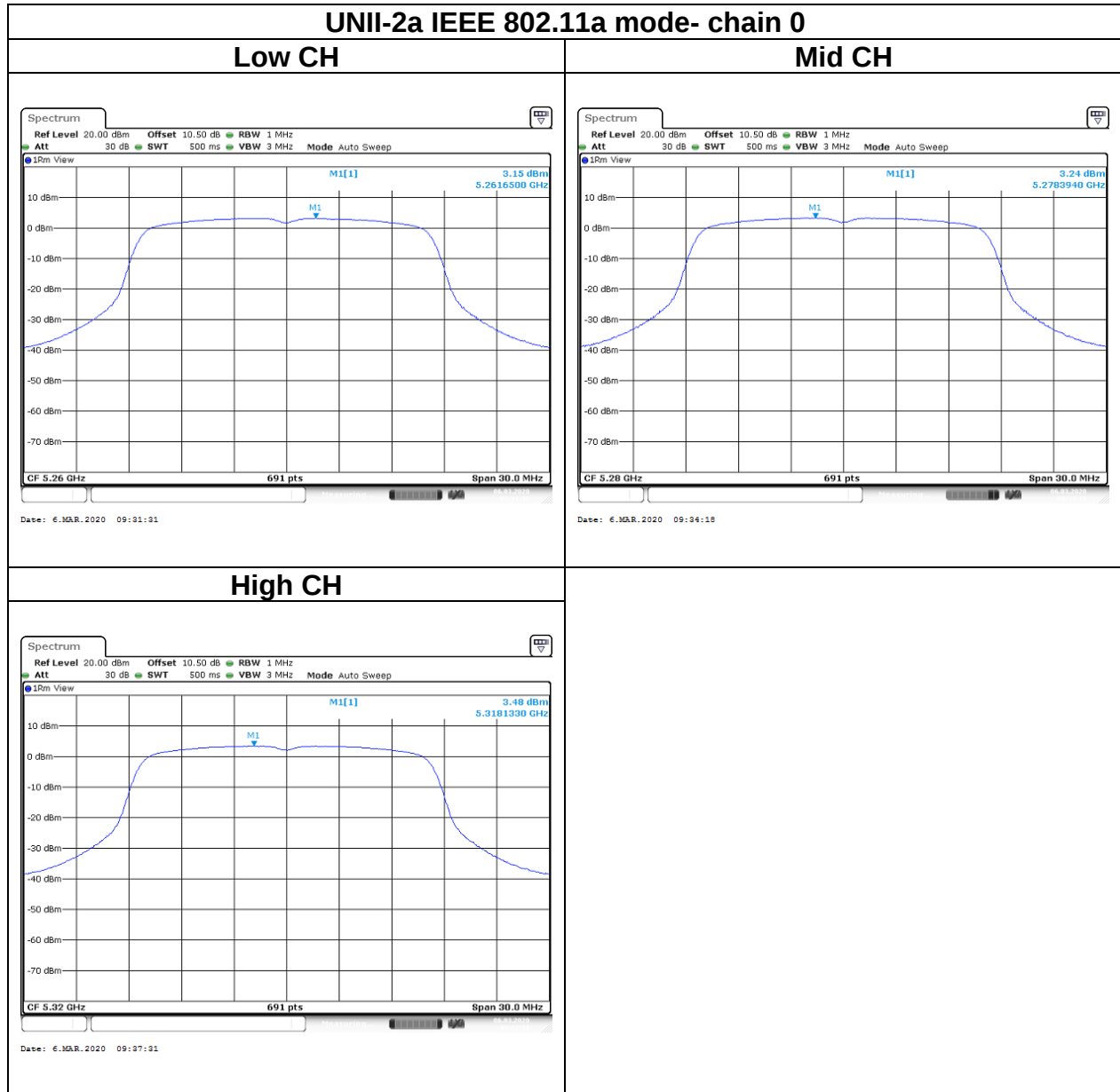
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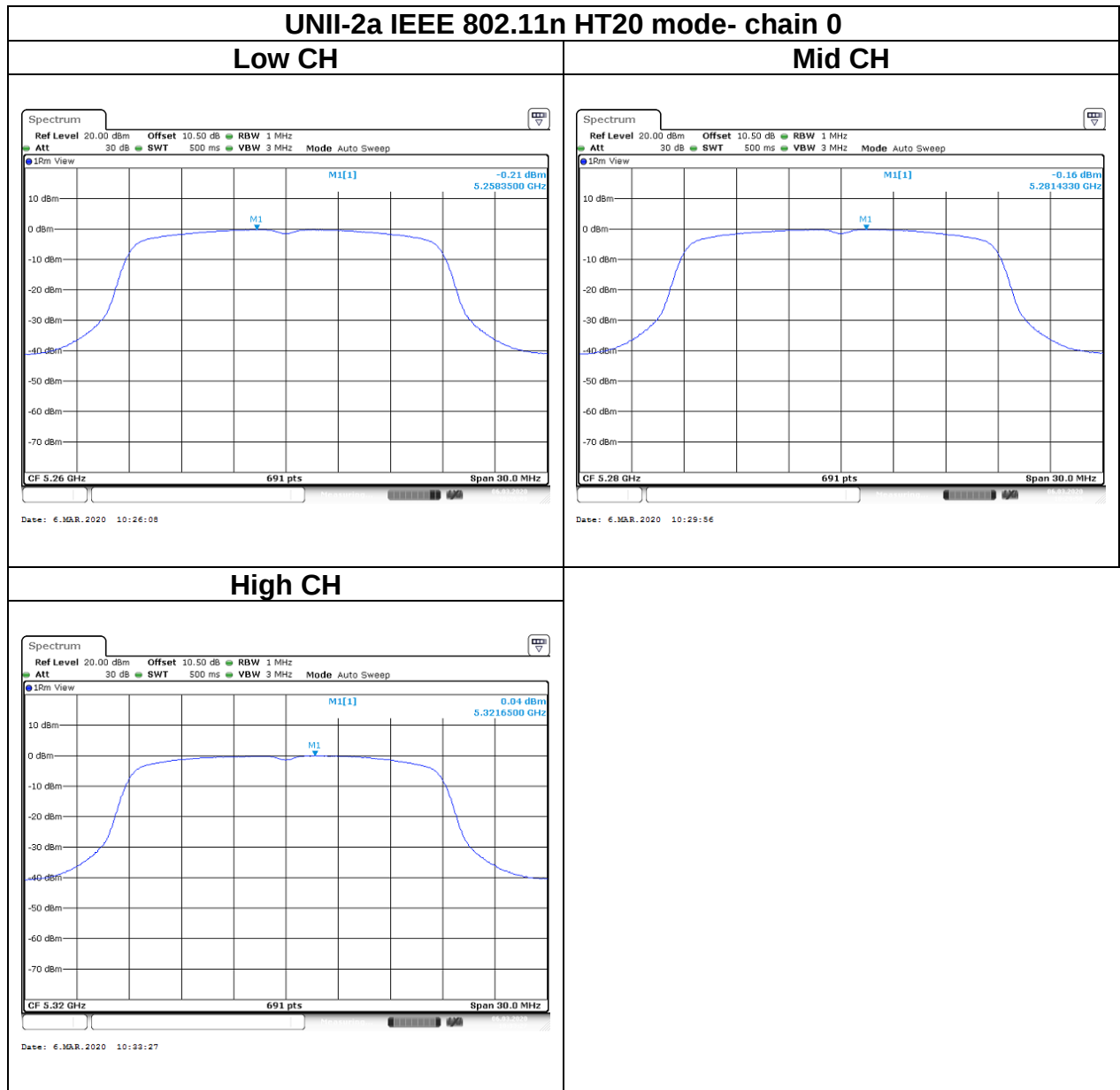




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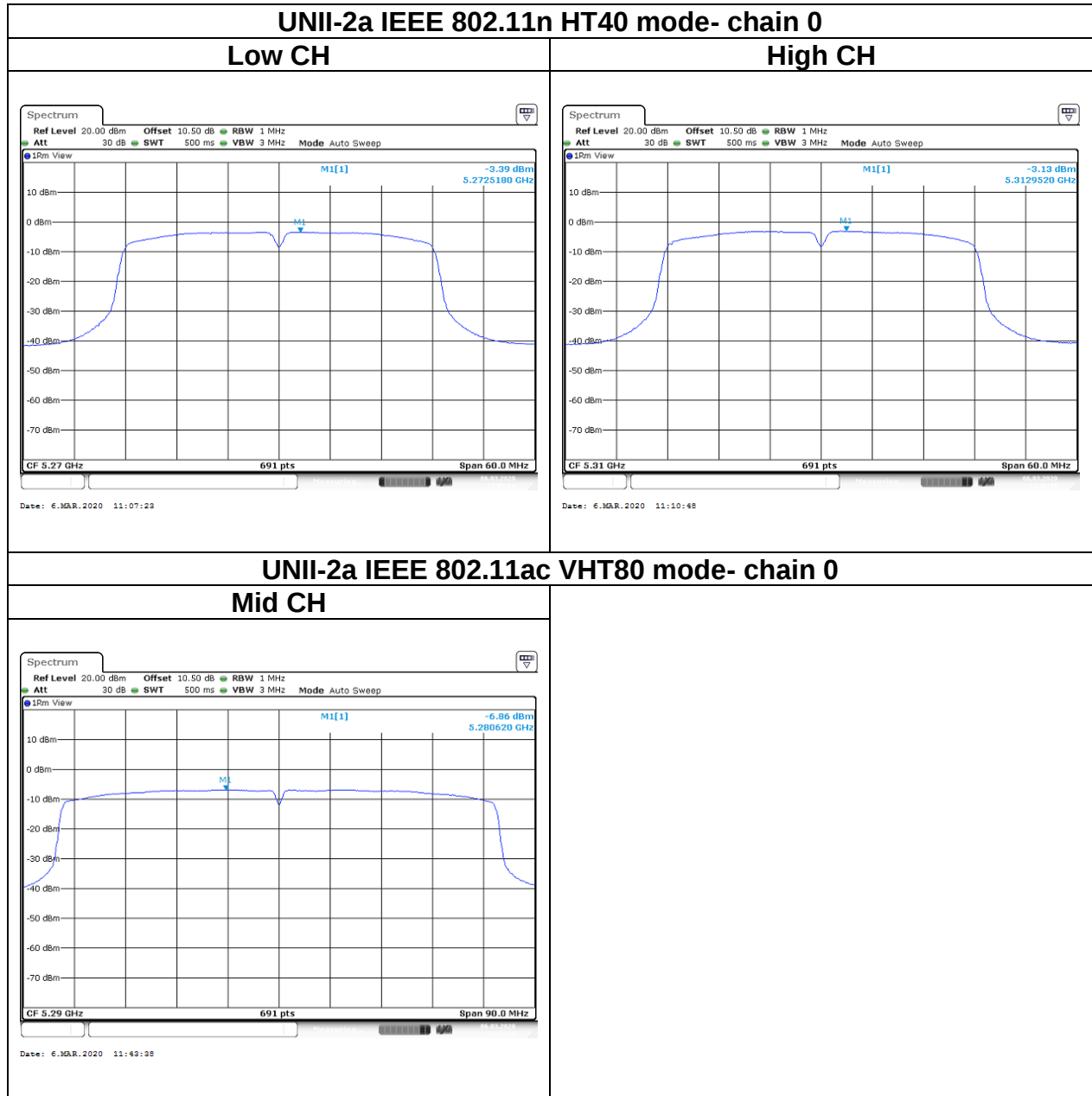




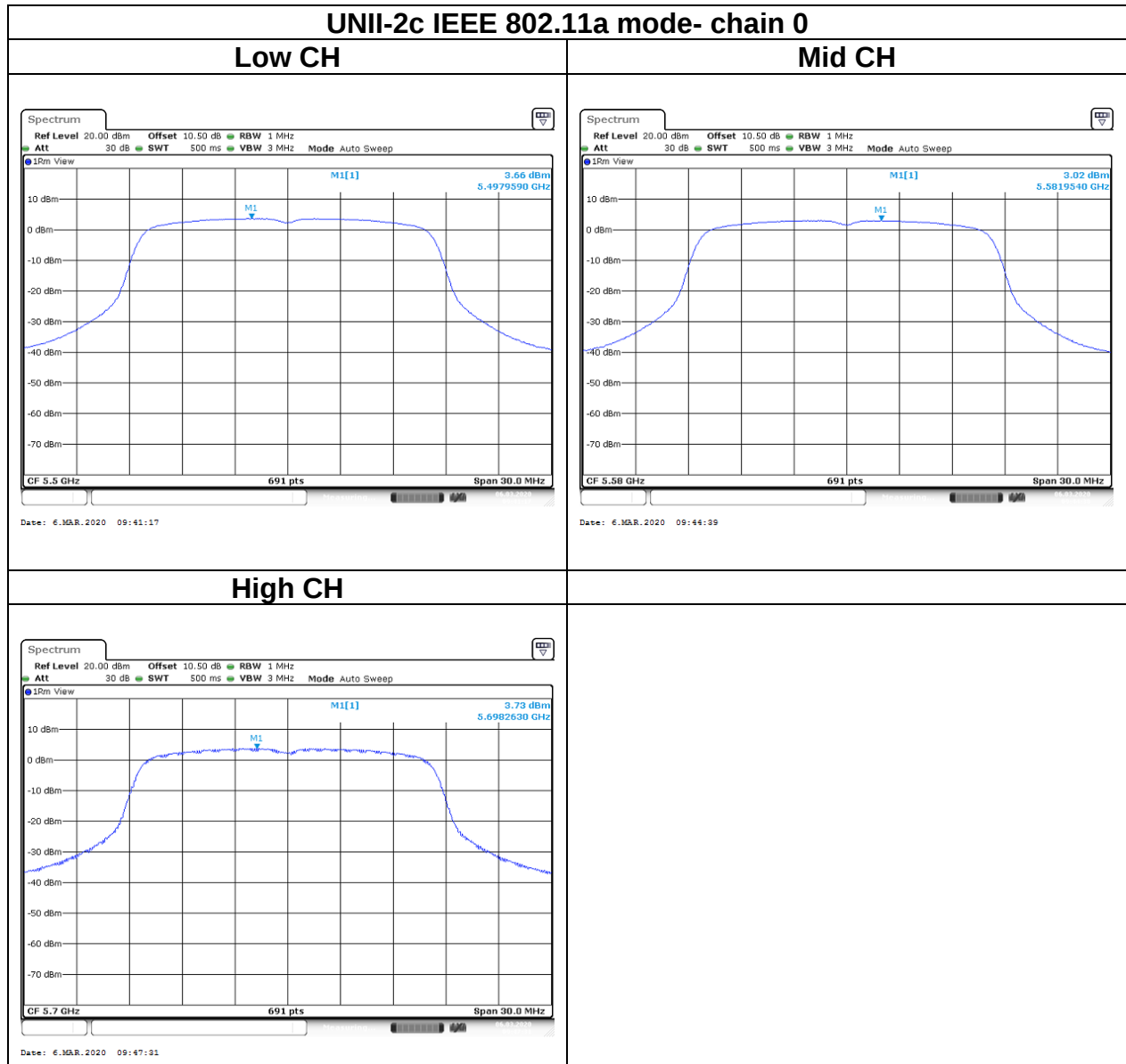
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Test Data

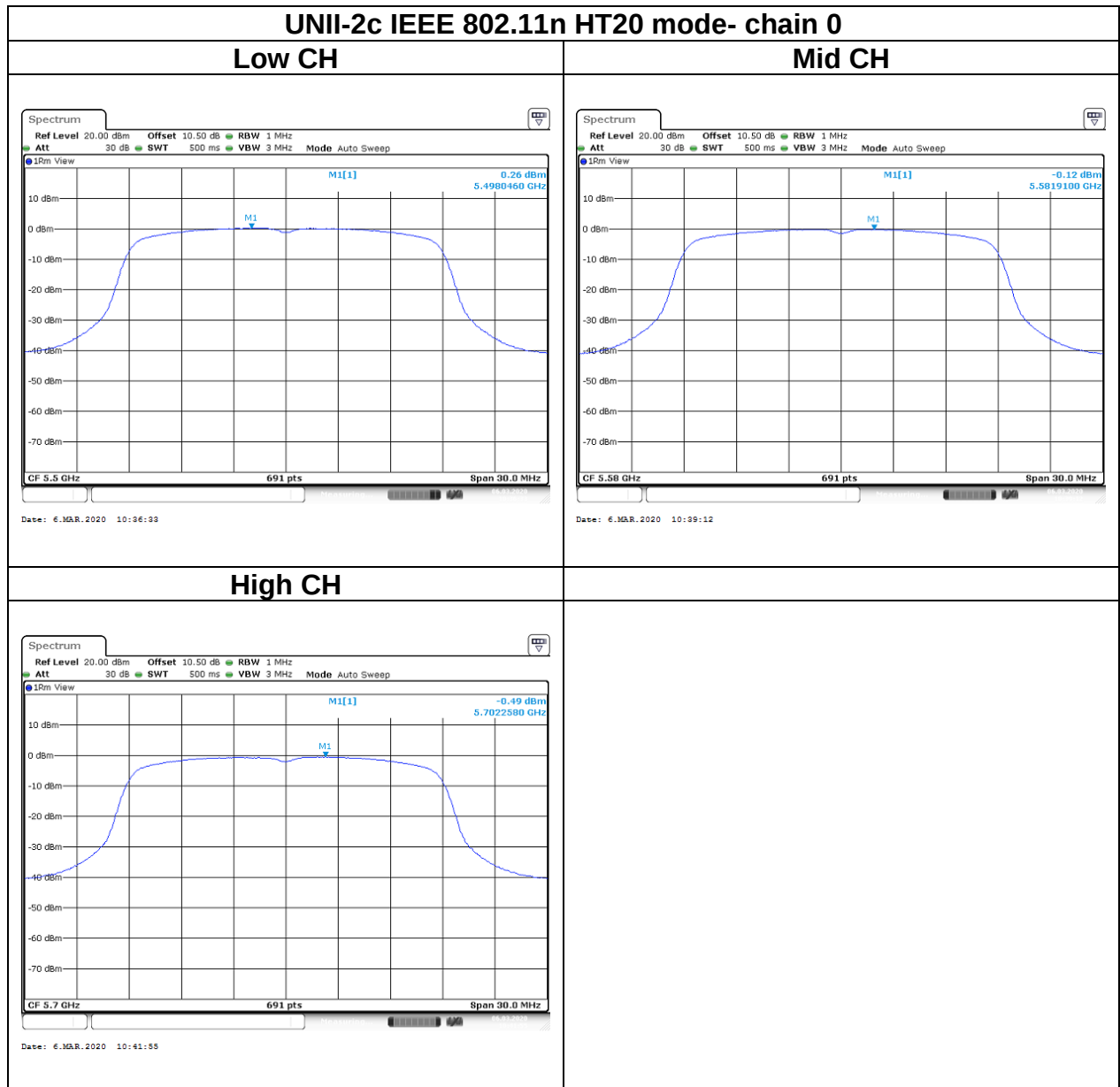


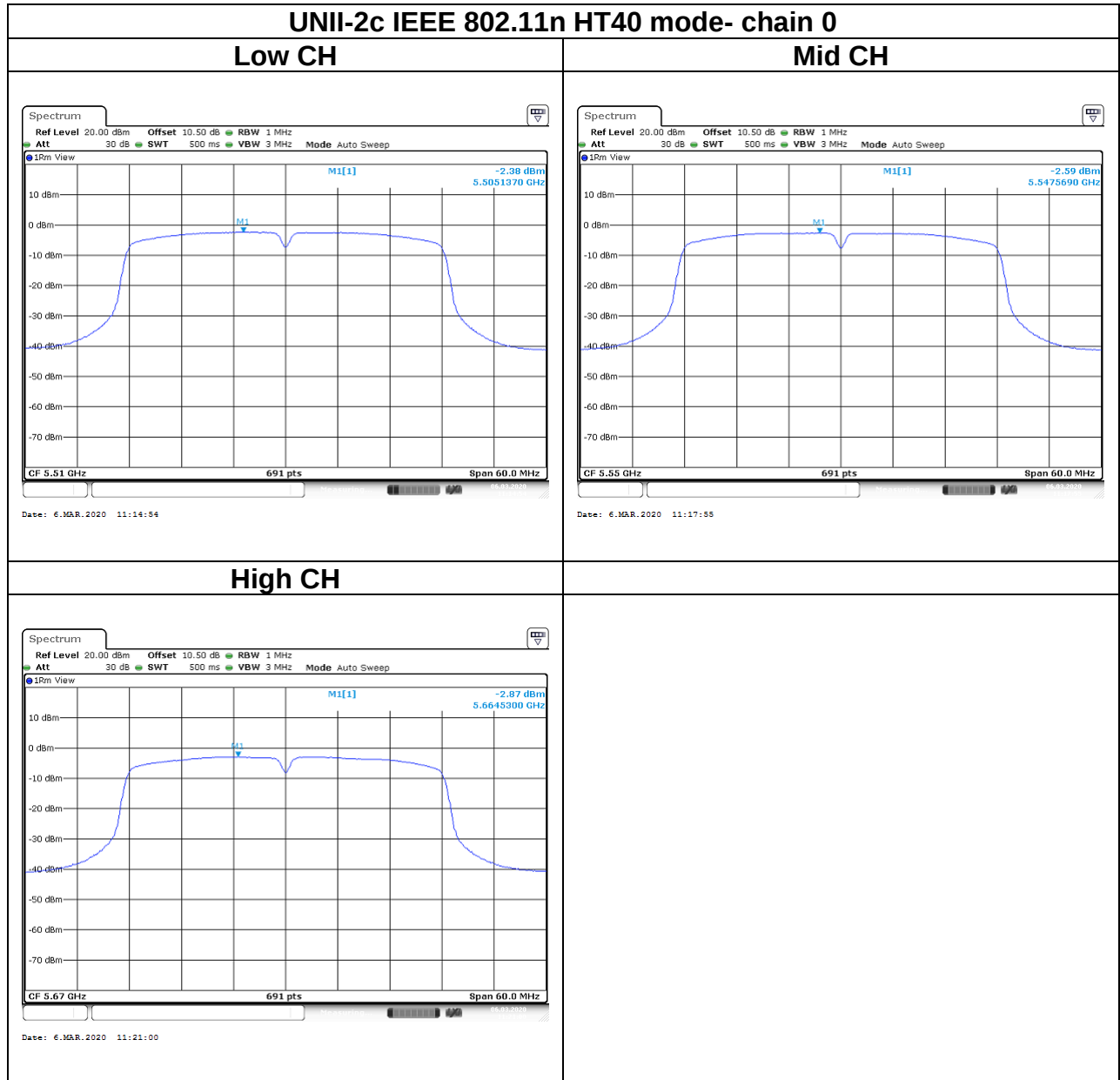


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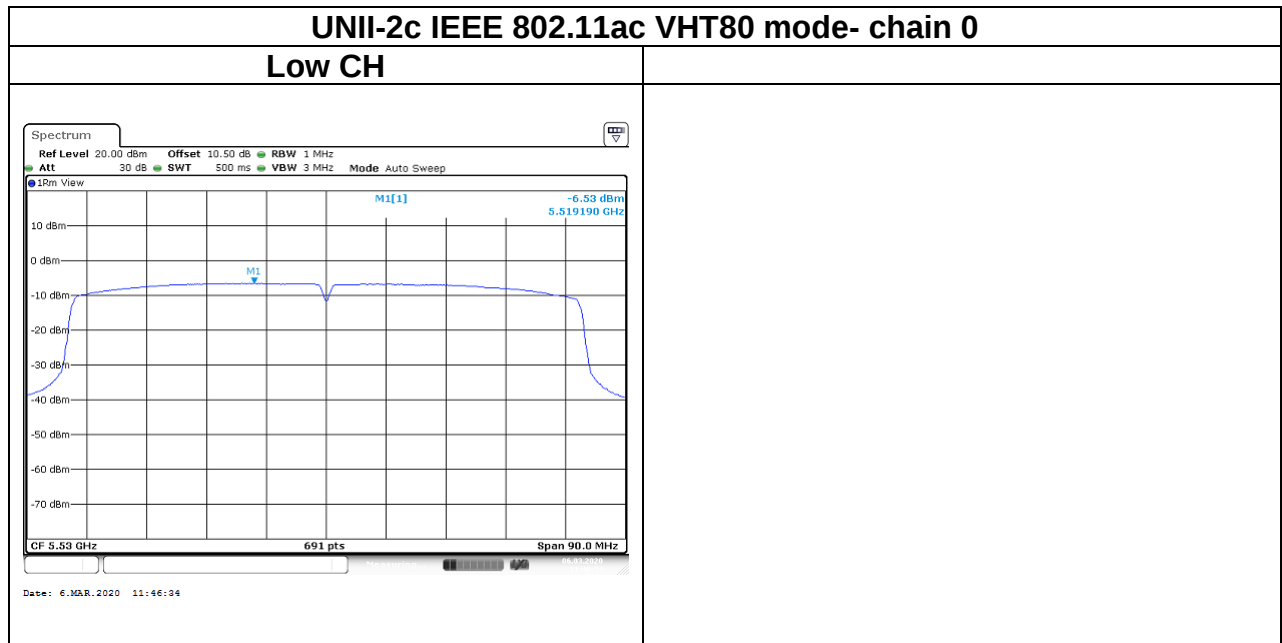






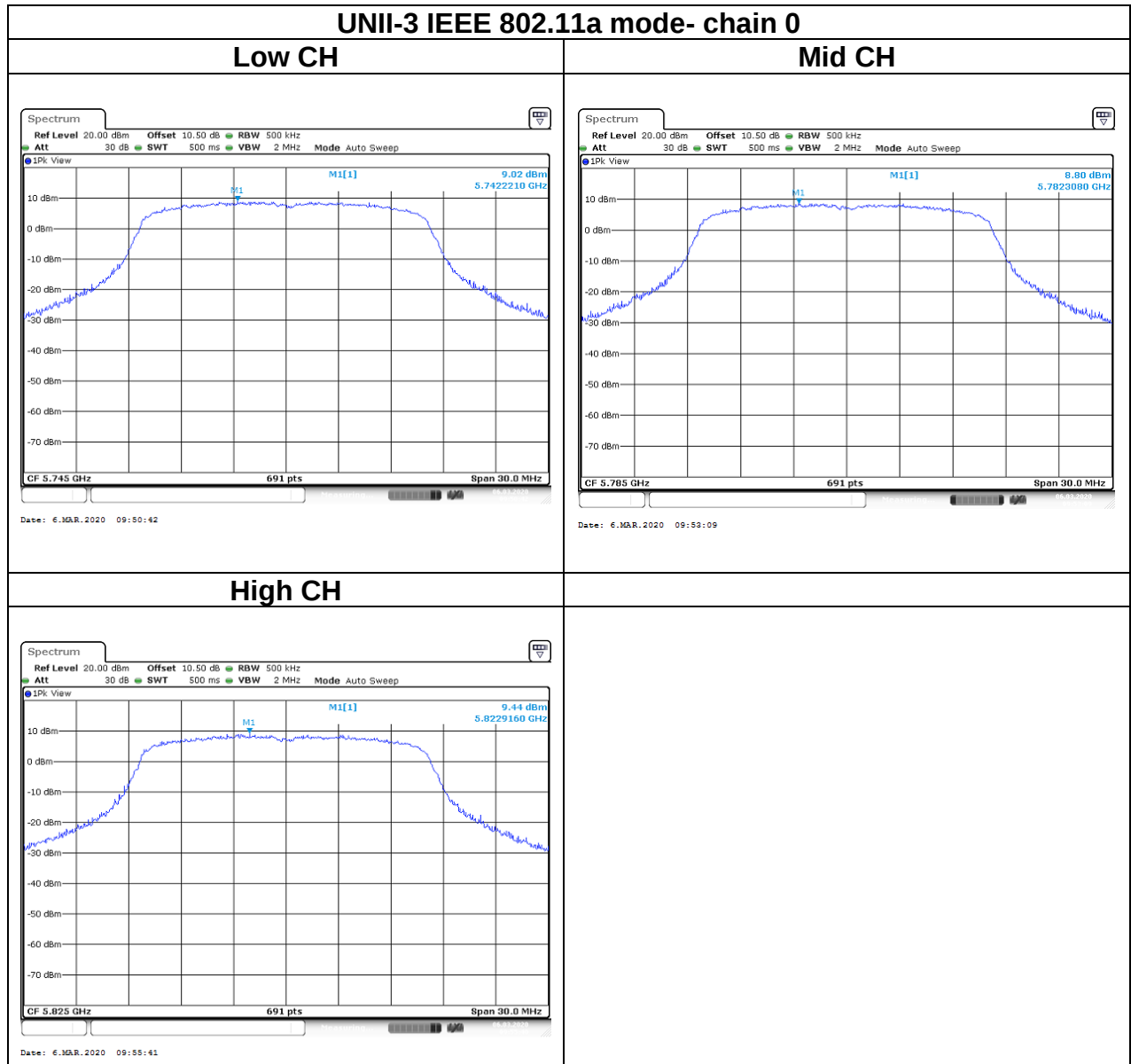
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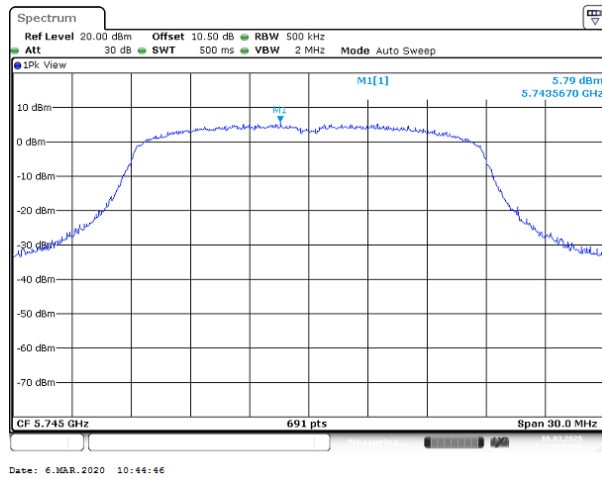
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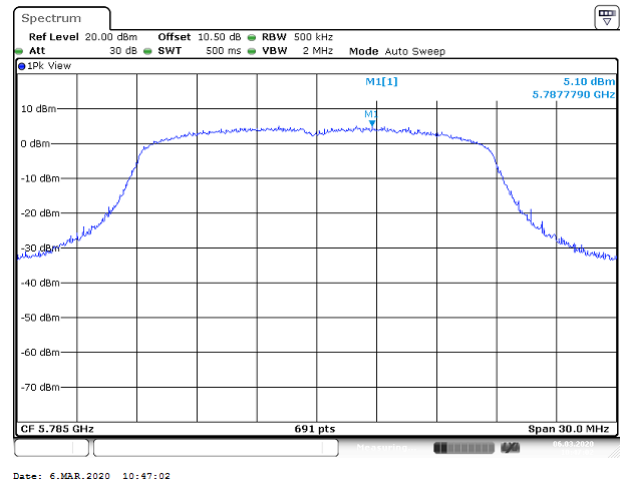


UNII-3 IEEE 802.11n HT20 mode- chain 0

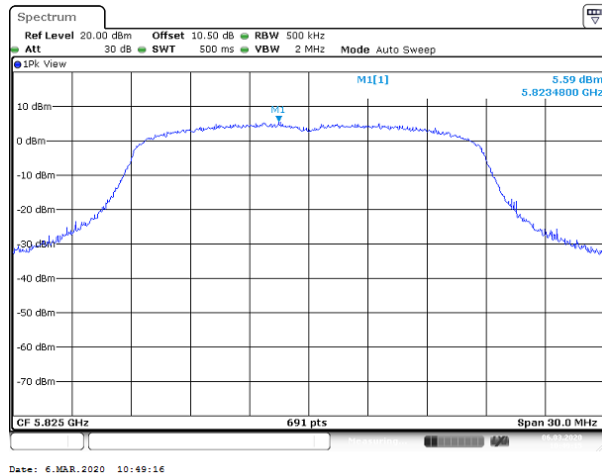
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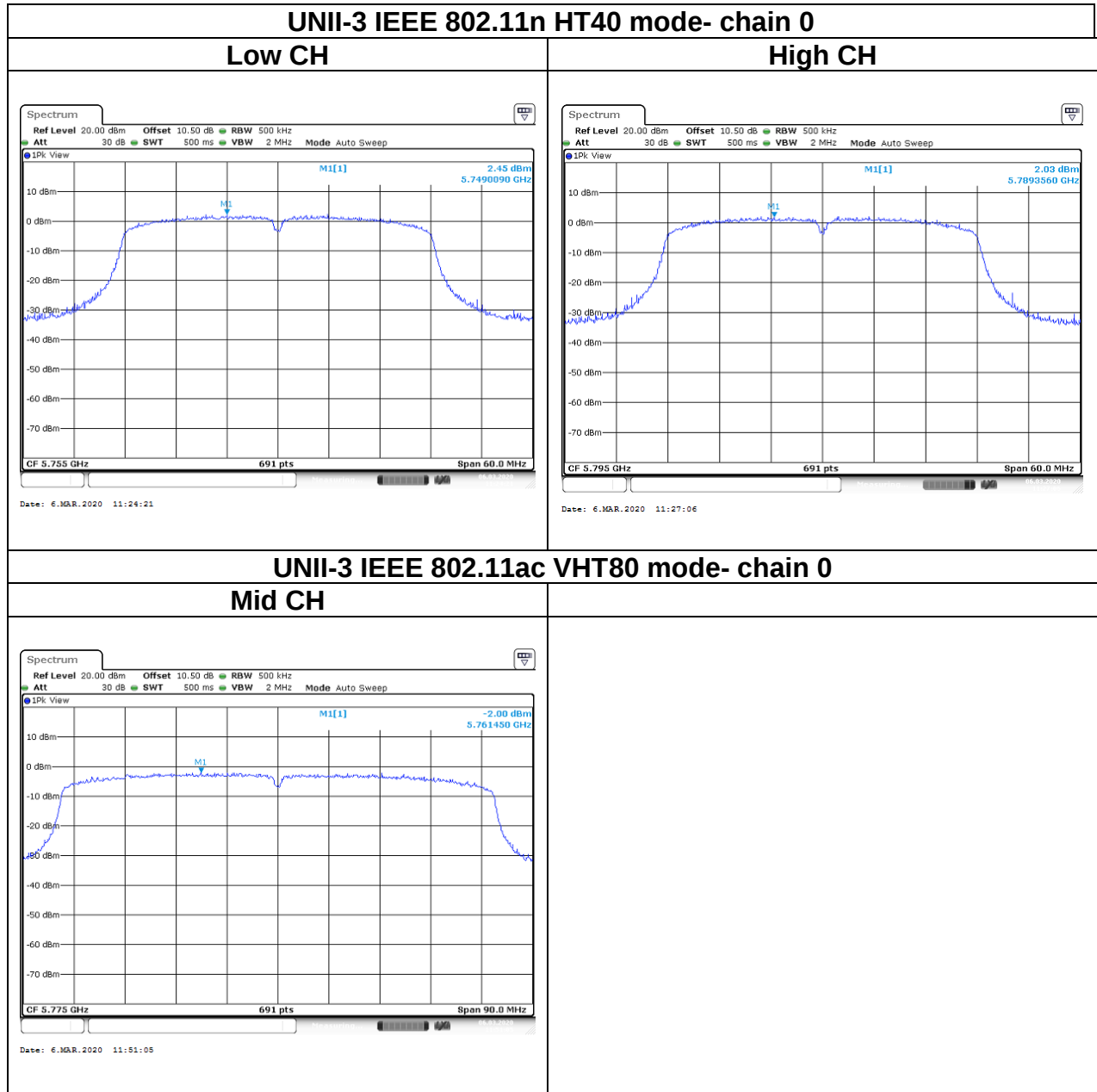


Mid CH



High CH

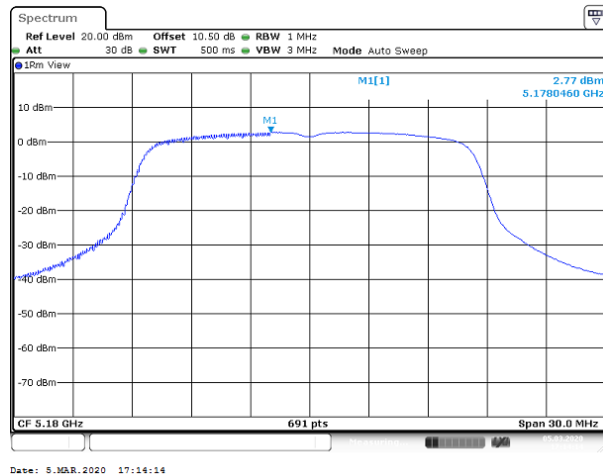




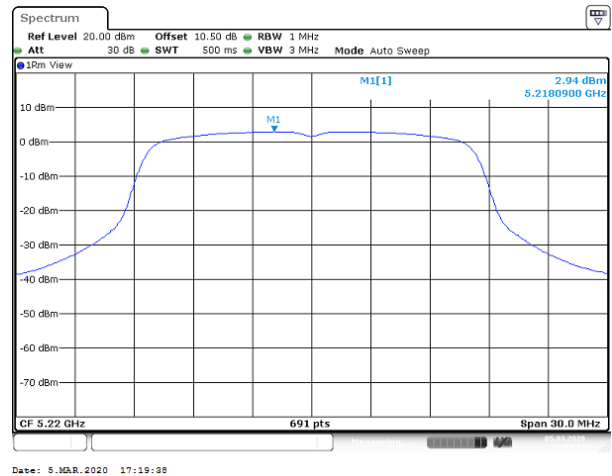
Chain 1:

UNII-1 IEEE 802.11a mode- chain 1

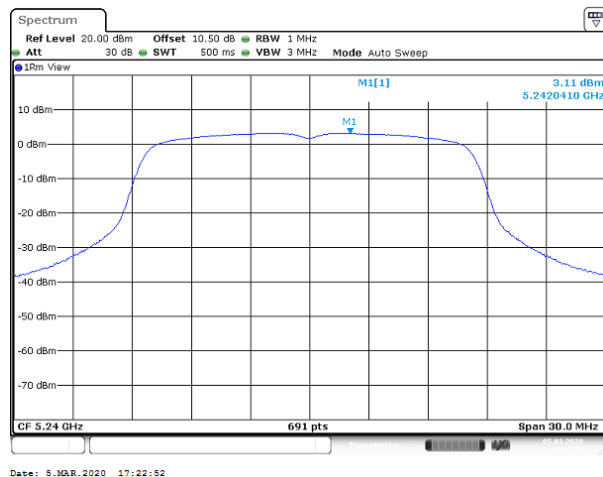
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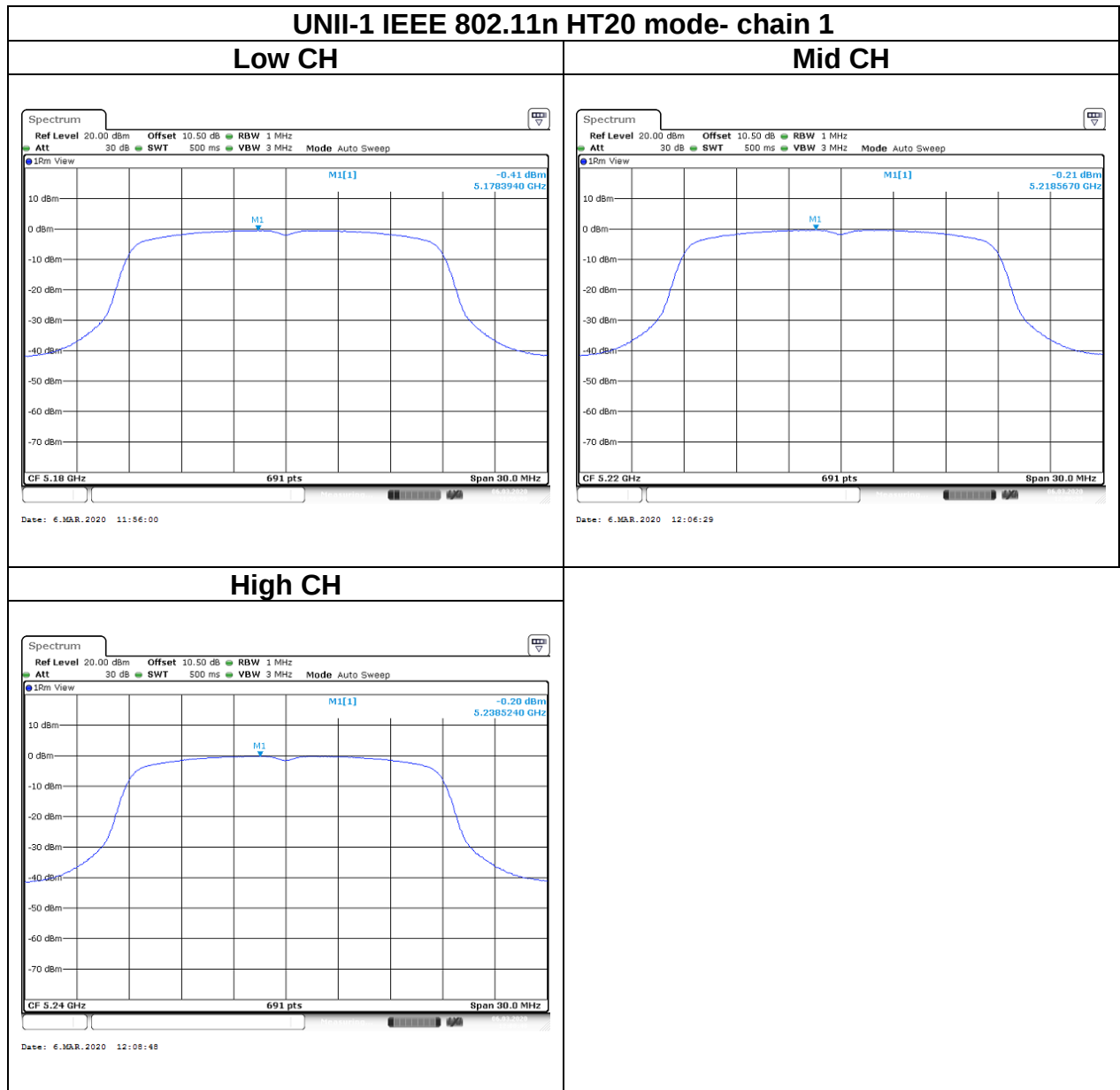


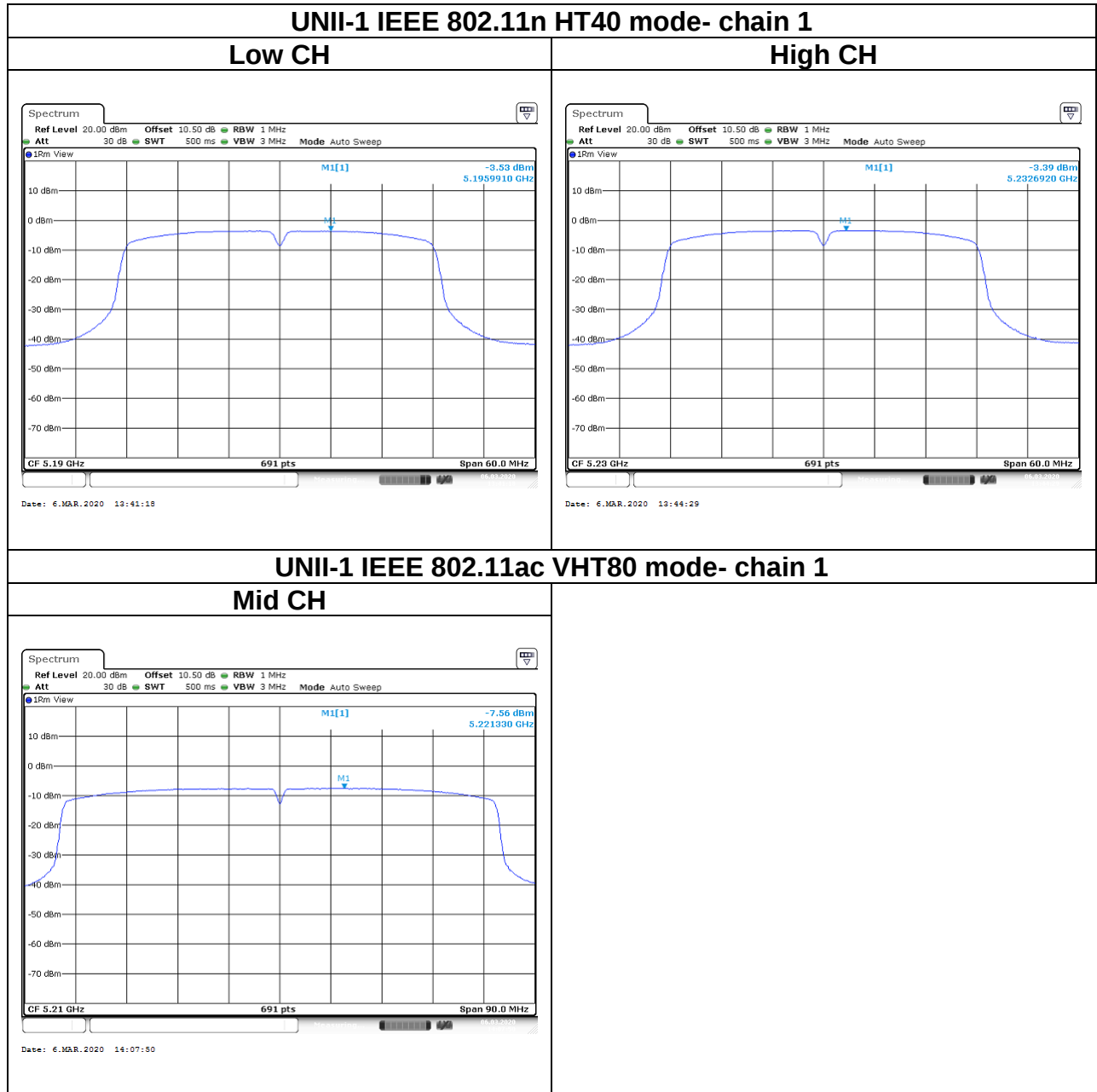
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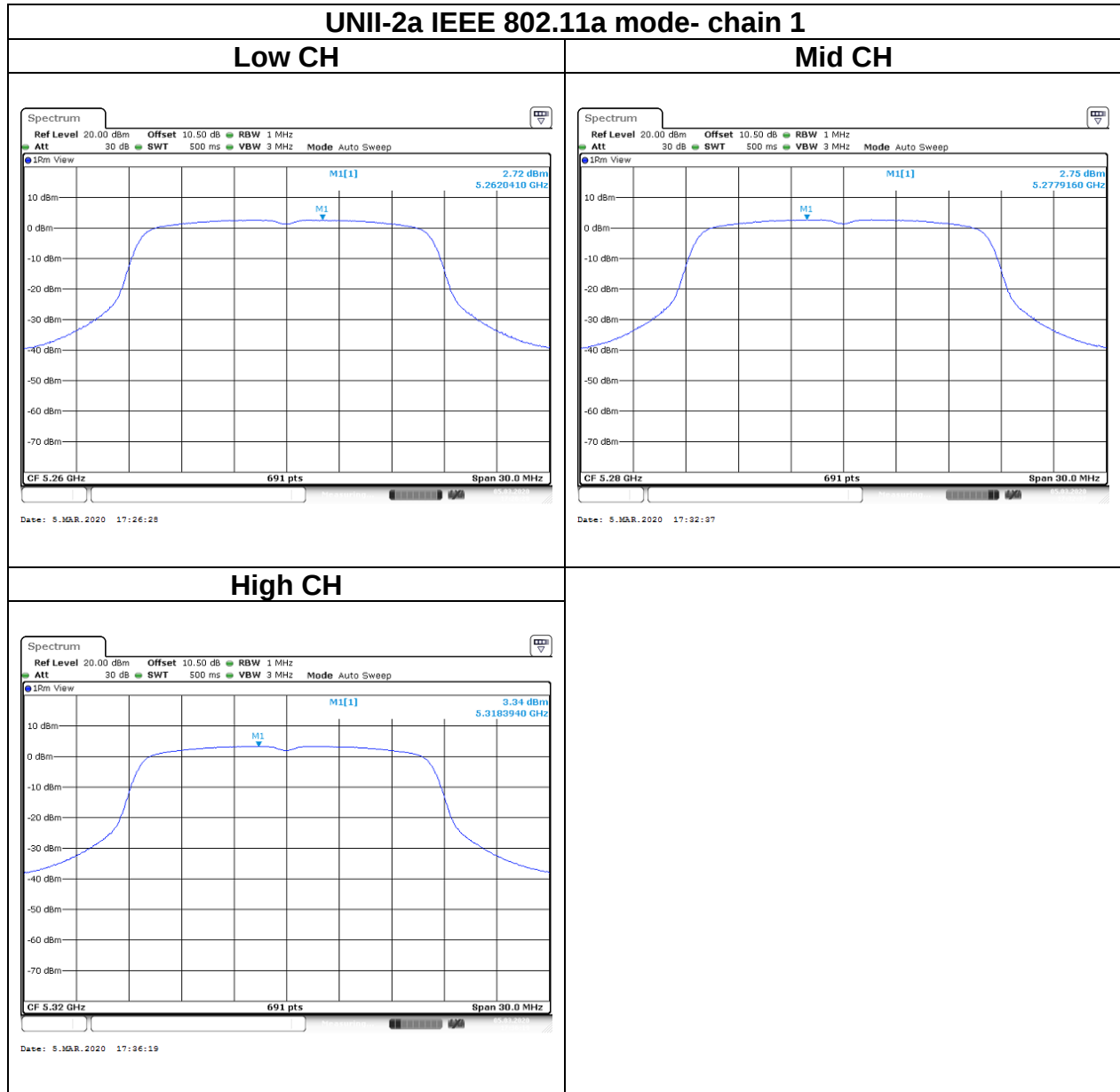






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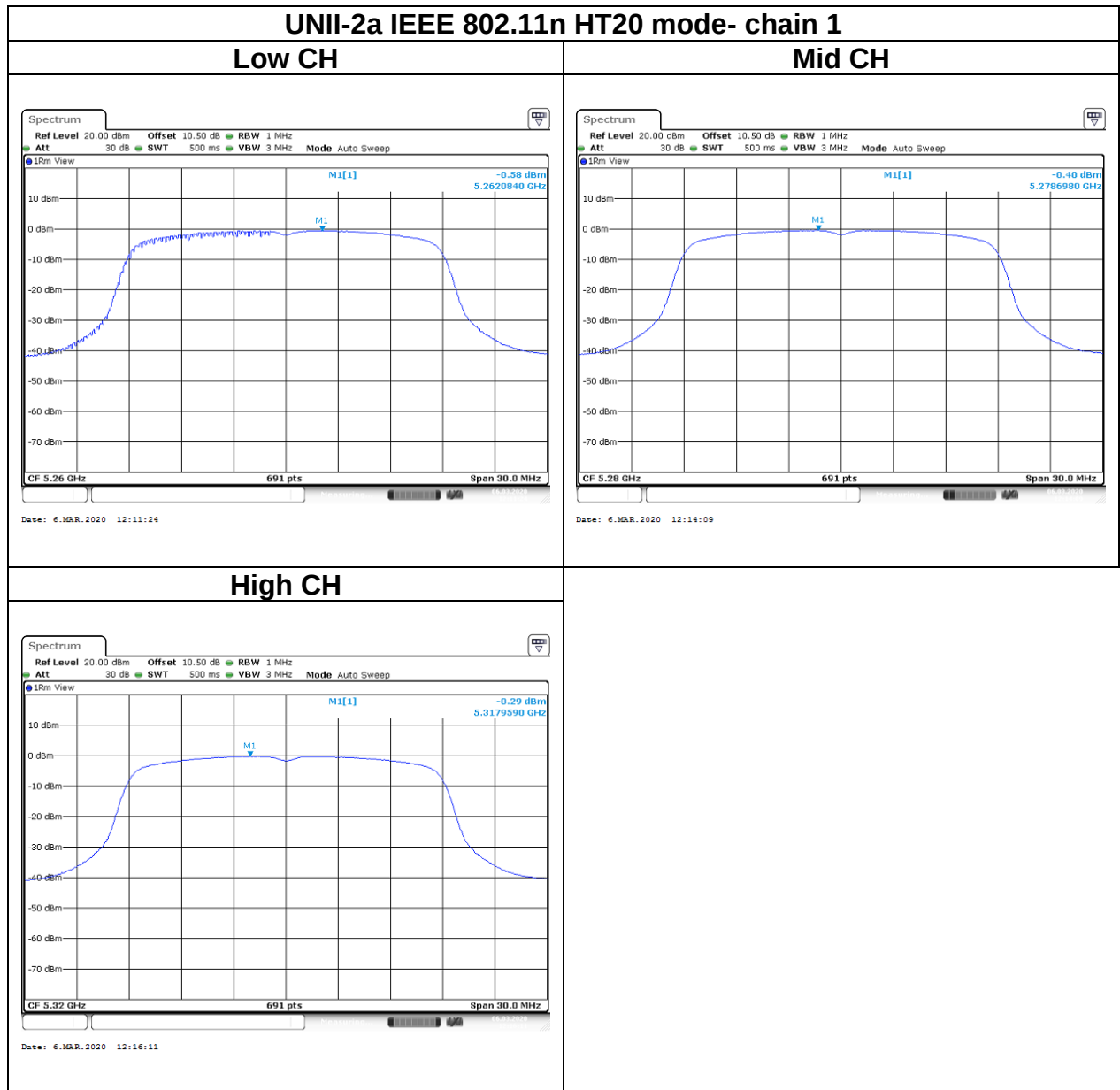


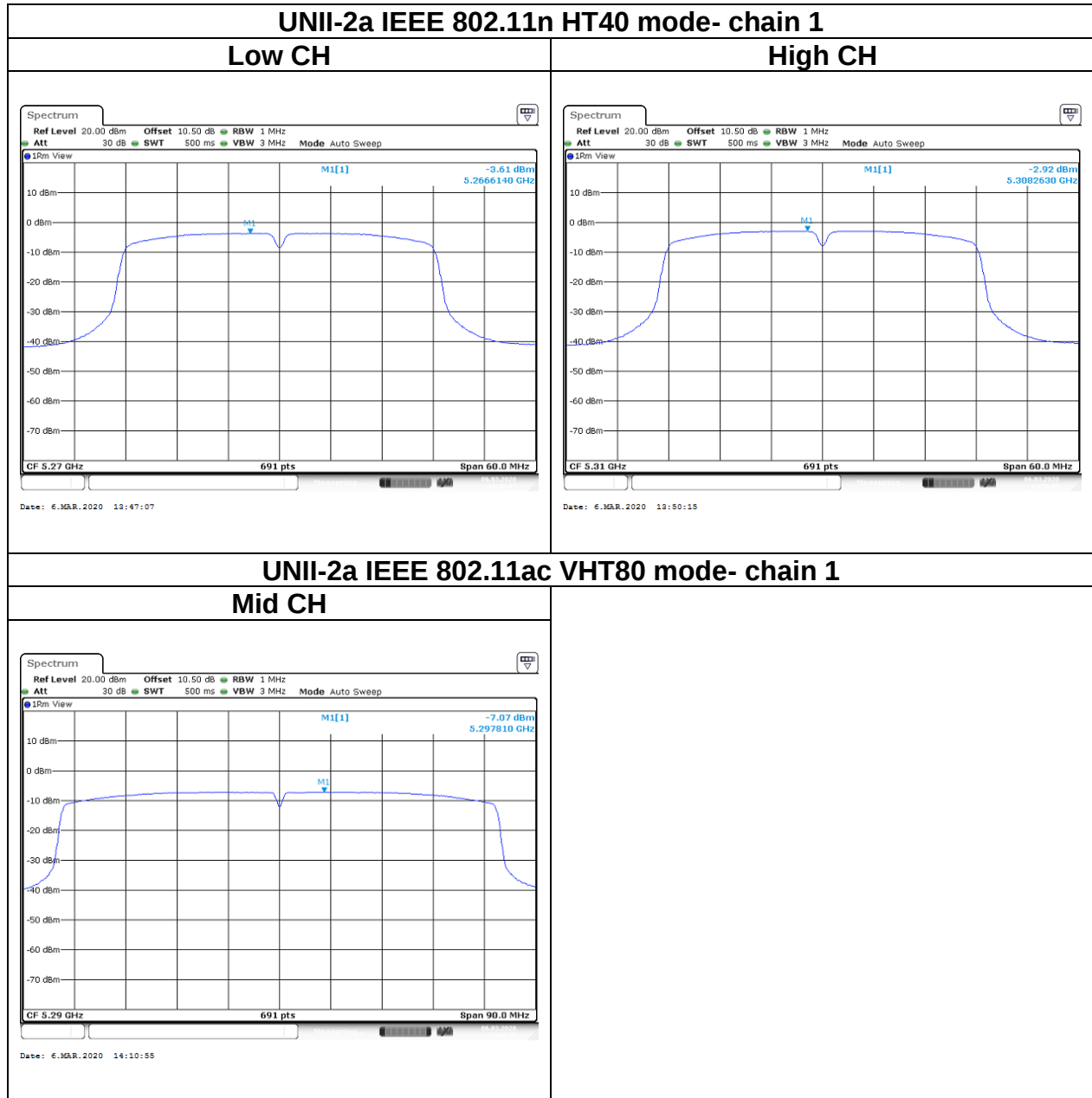


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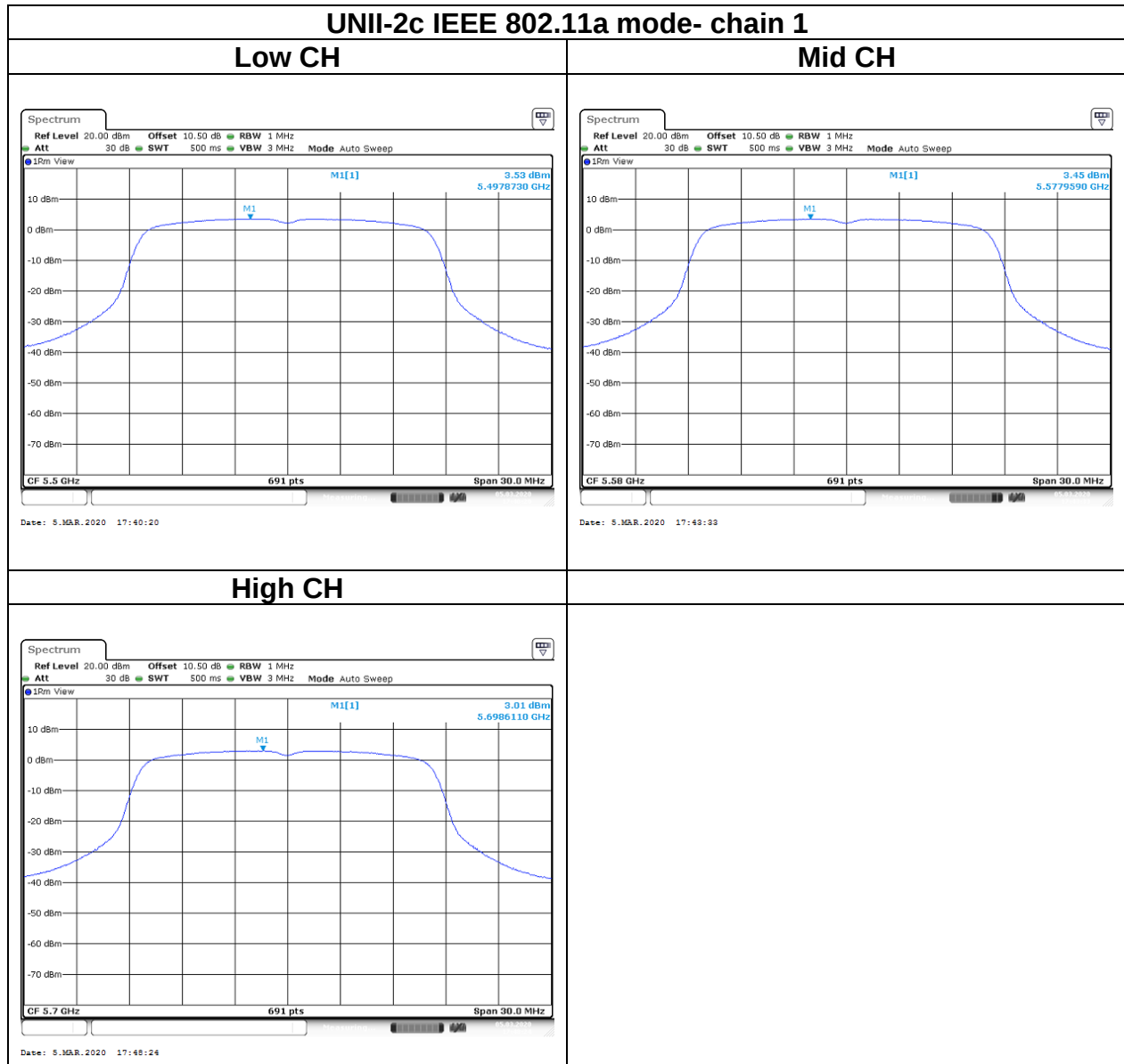
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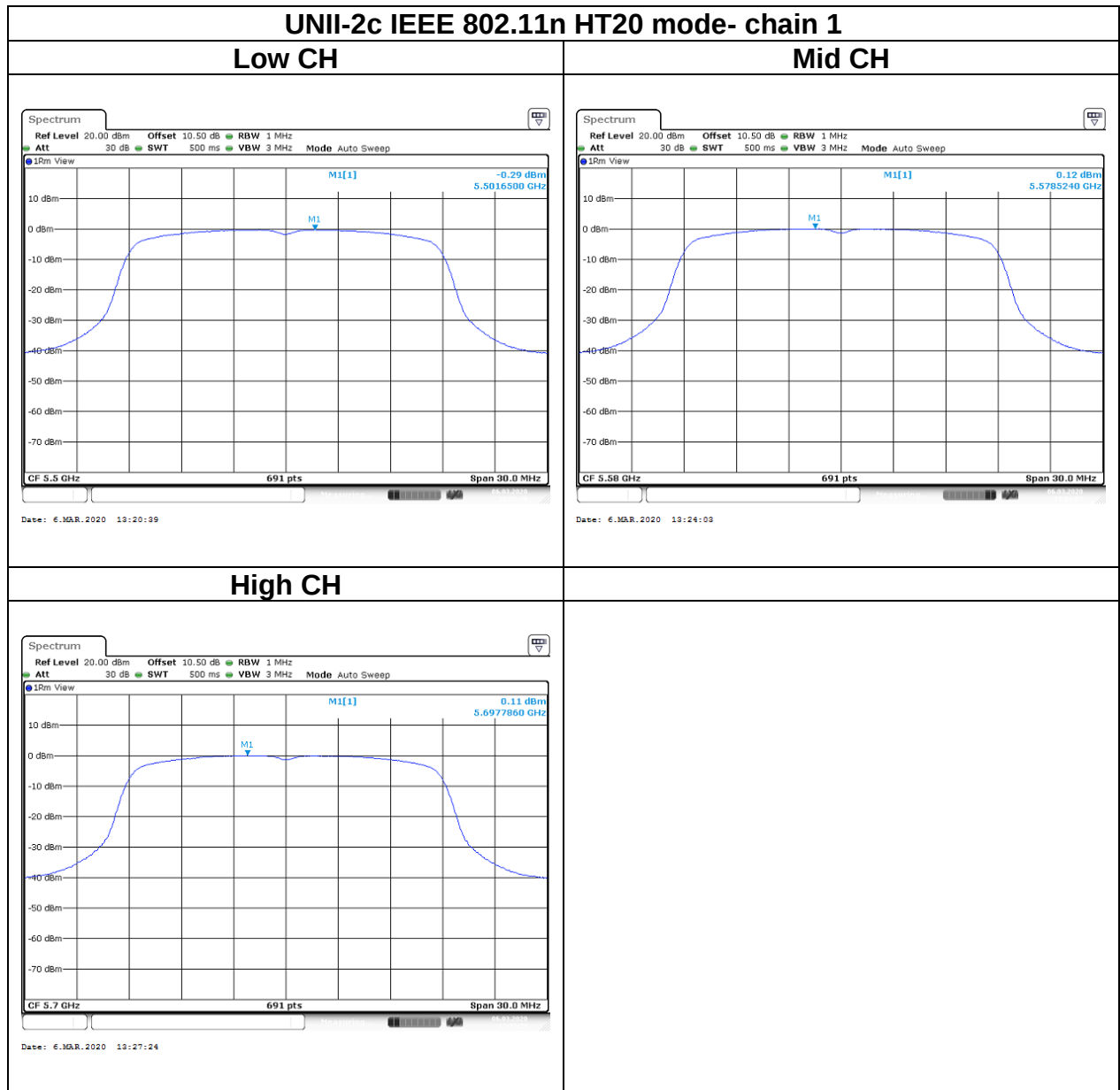


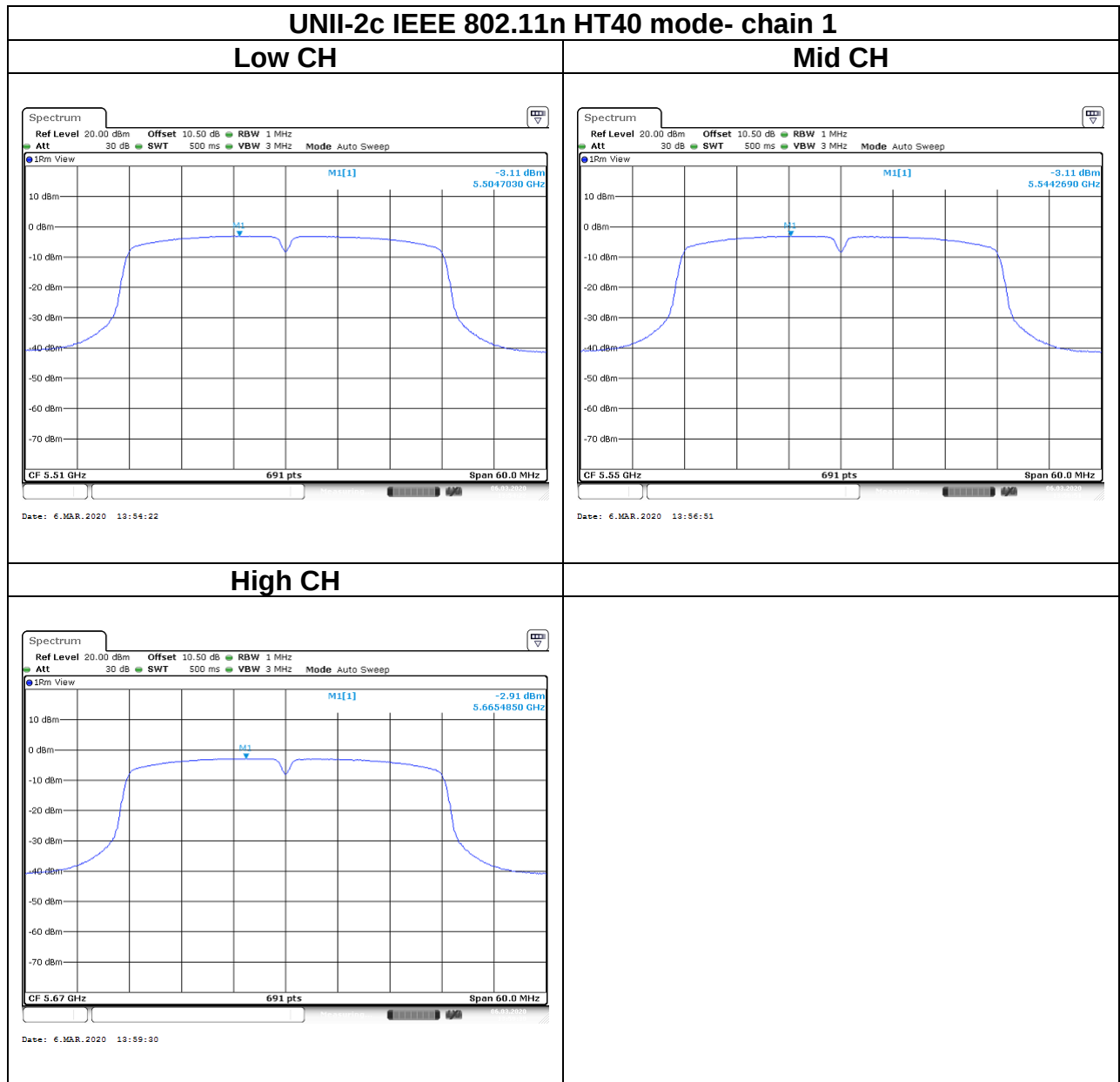


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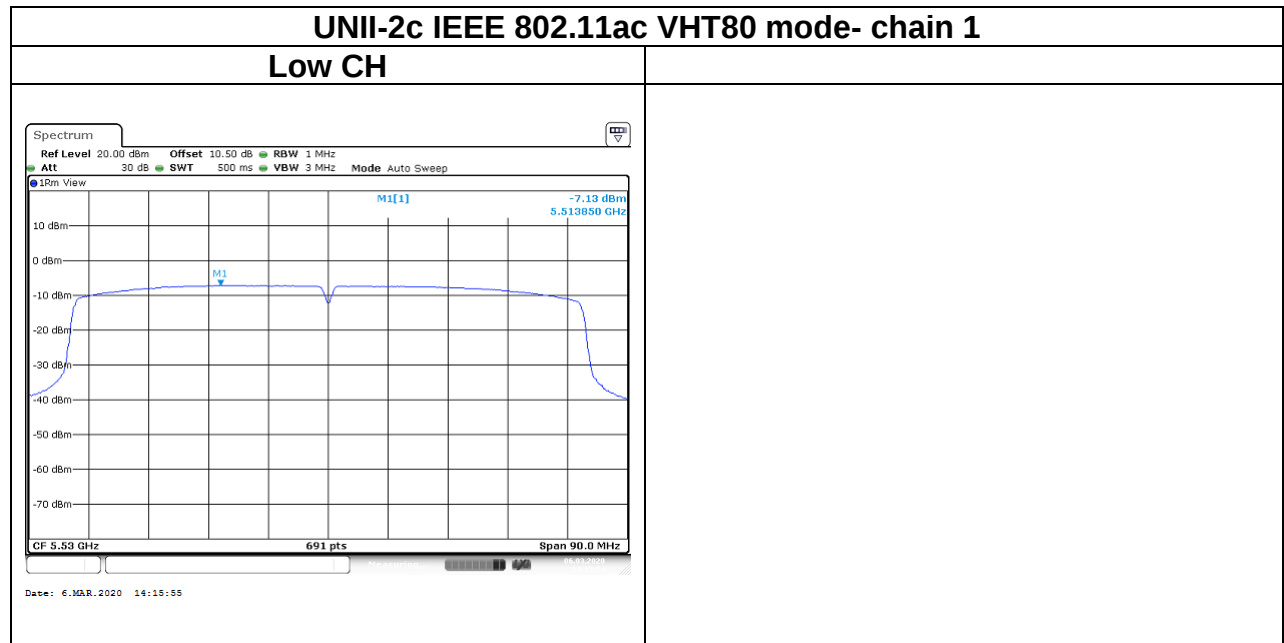






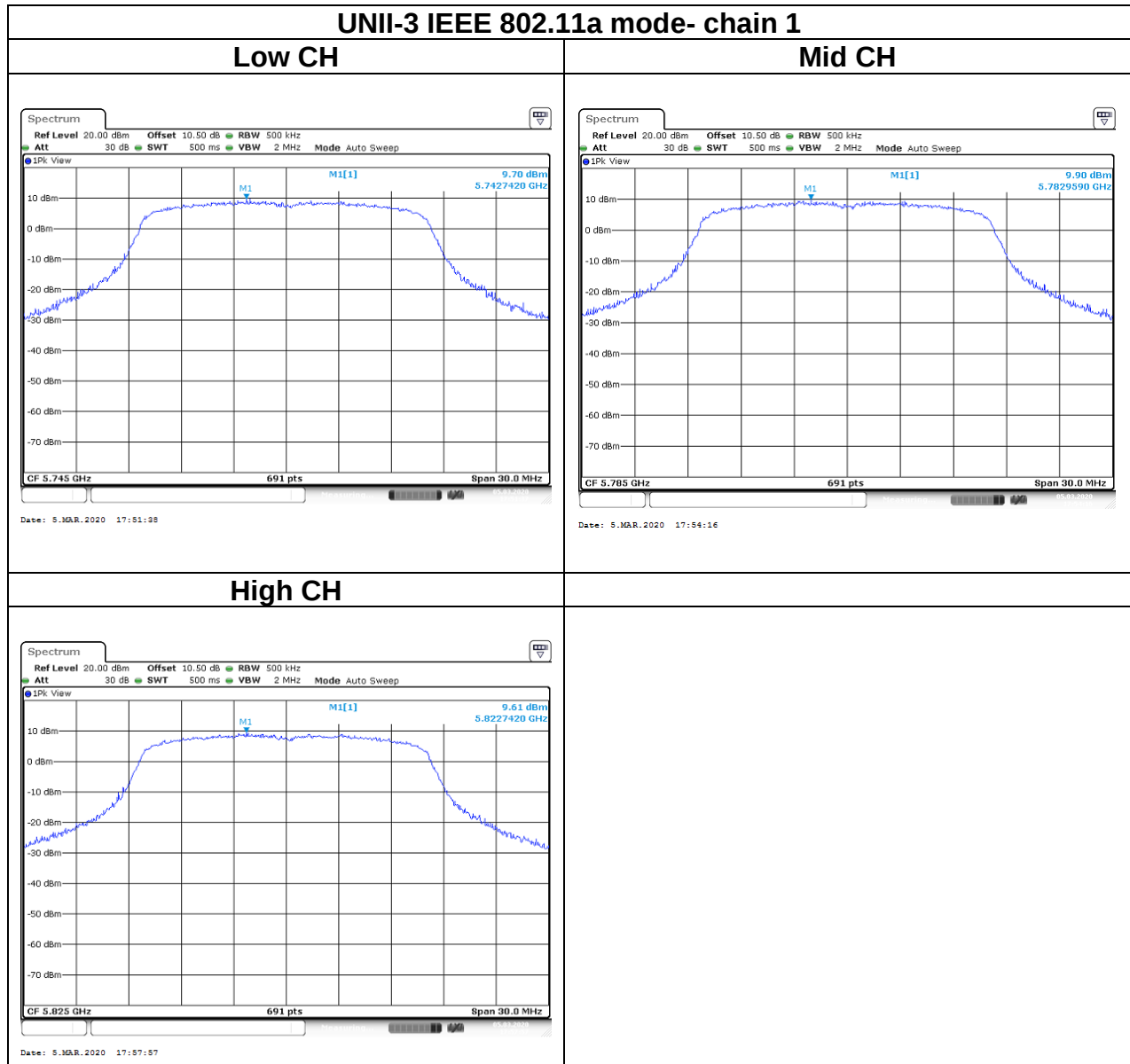
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Test Data





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