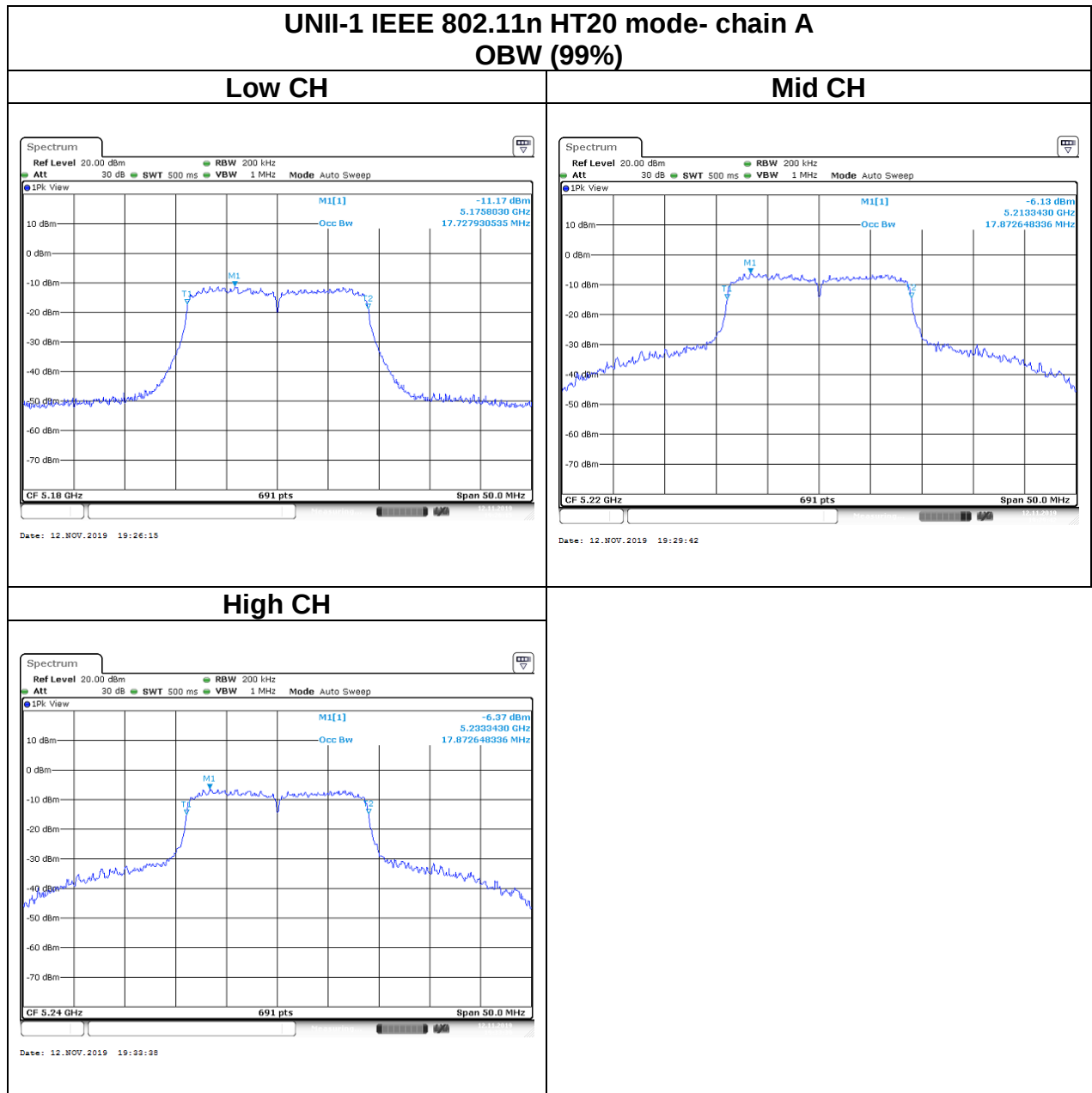
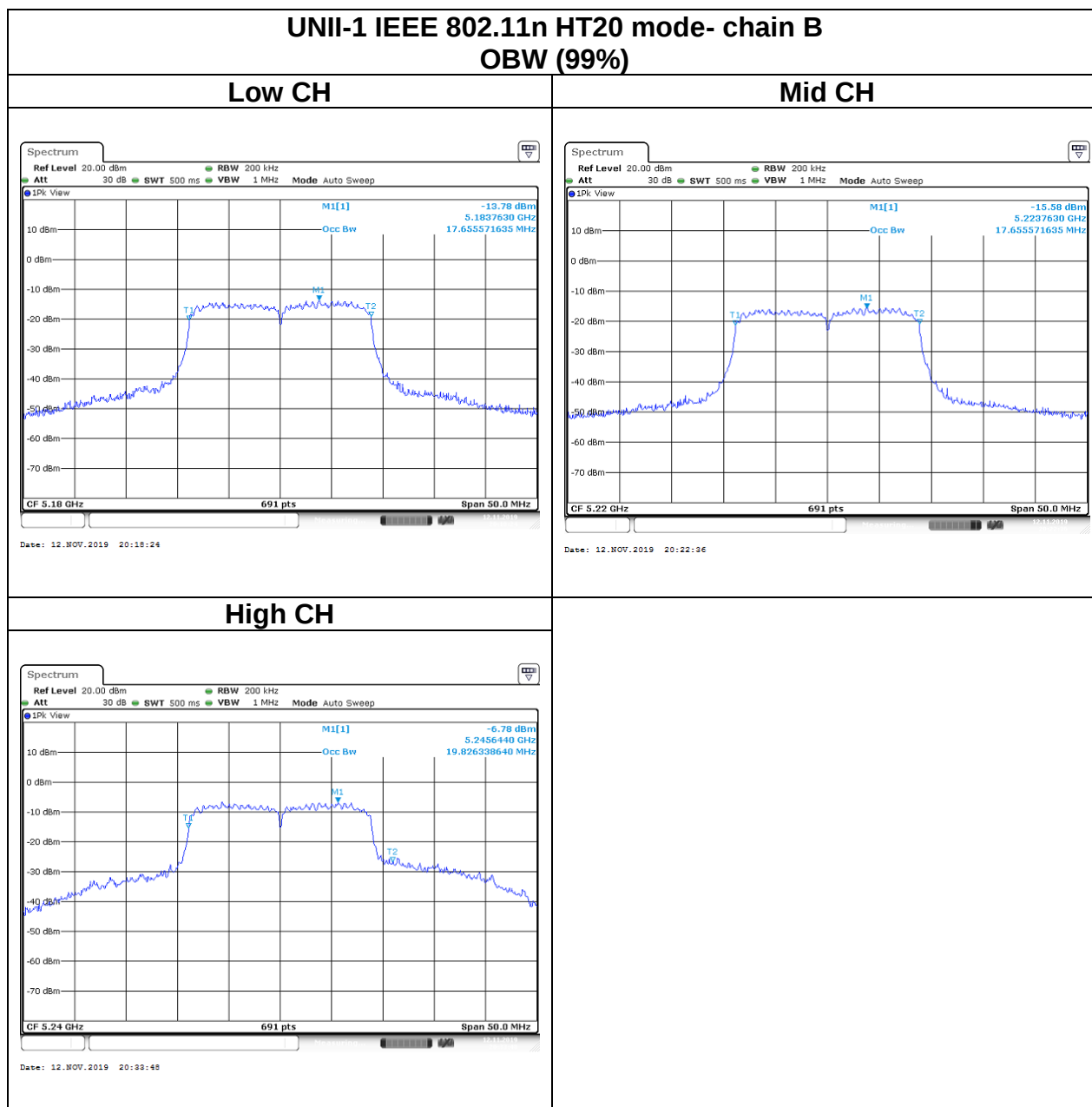




Report No.: T190902W03-RP4

Page: 51 / 251
Rev.: 02

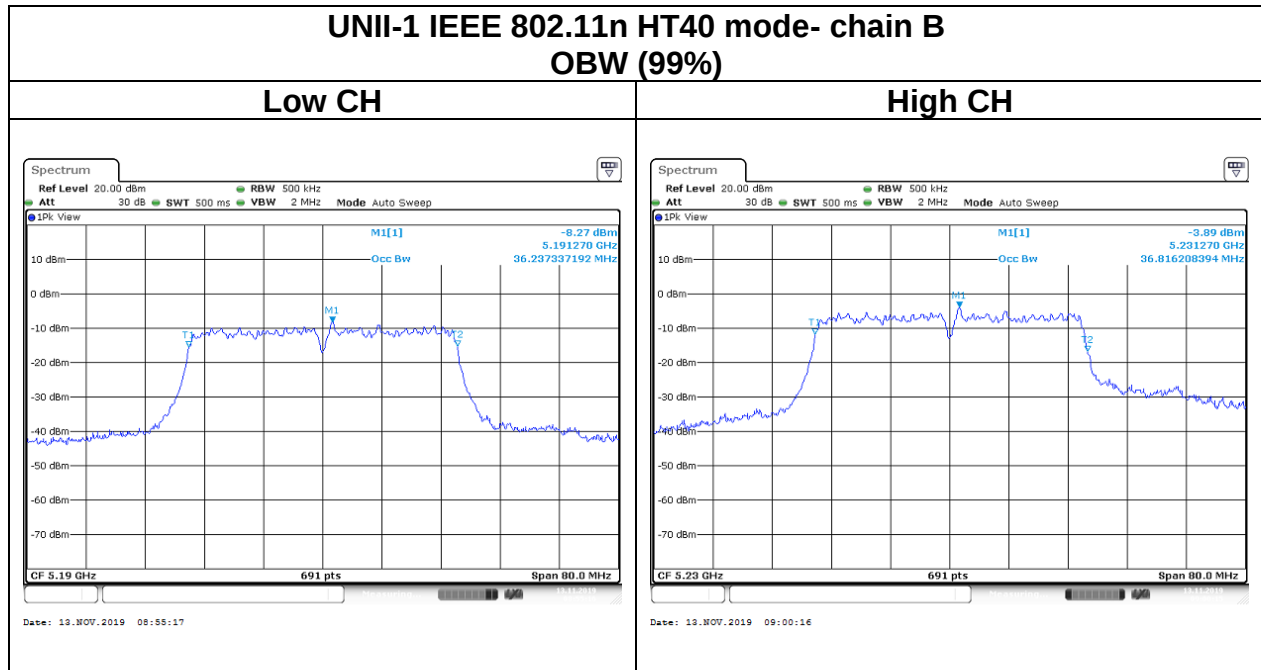
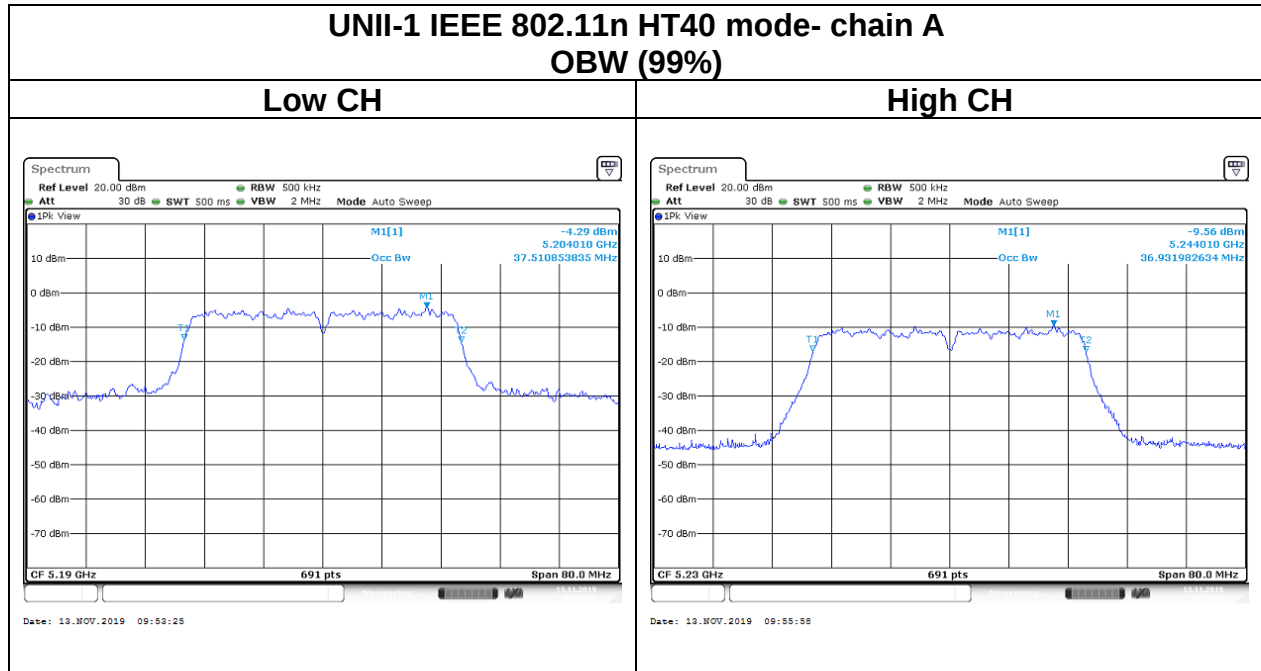






Report No.: T190902W03-RP4

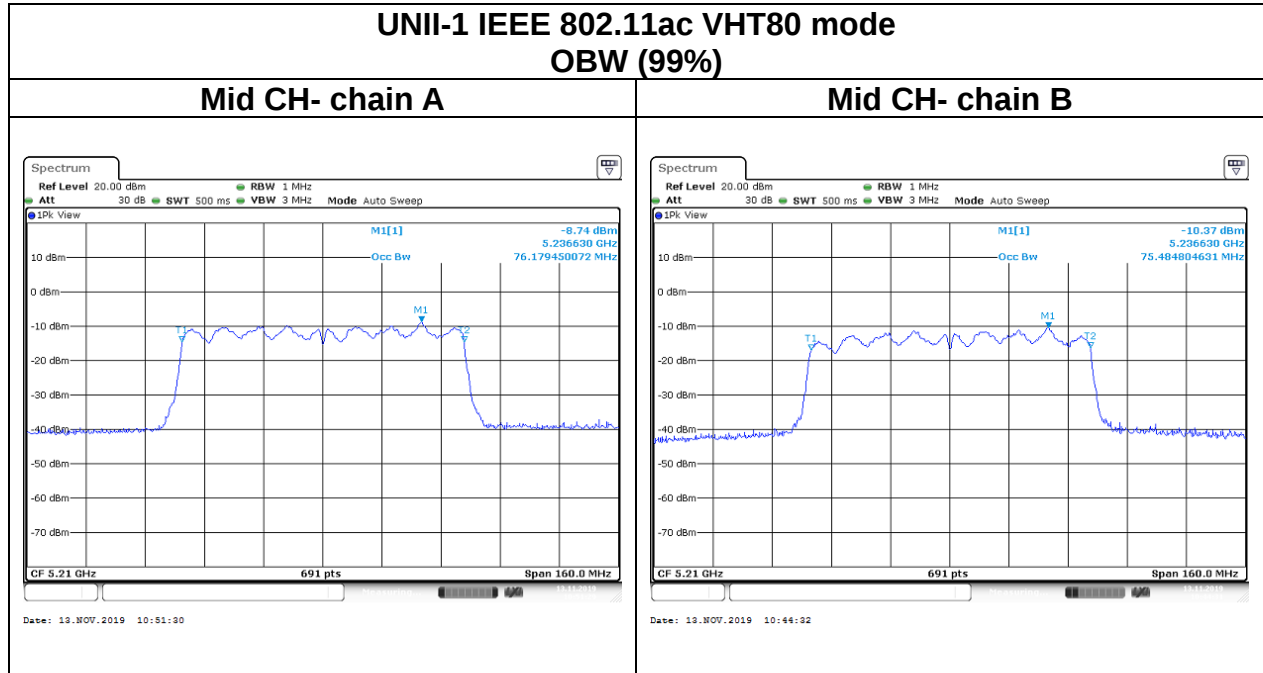
Page: 53 / 251
Rev.: 02



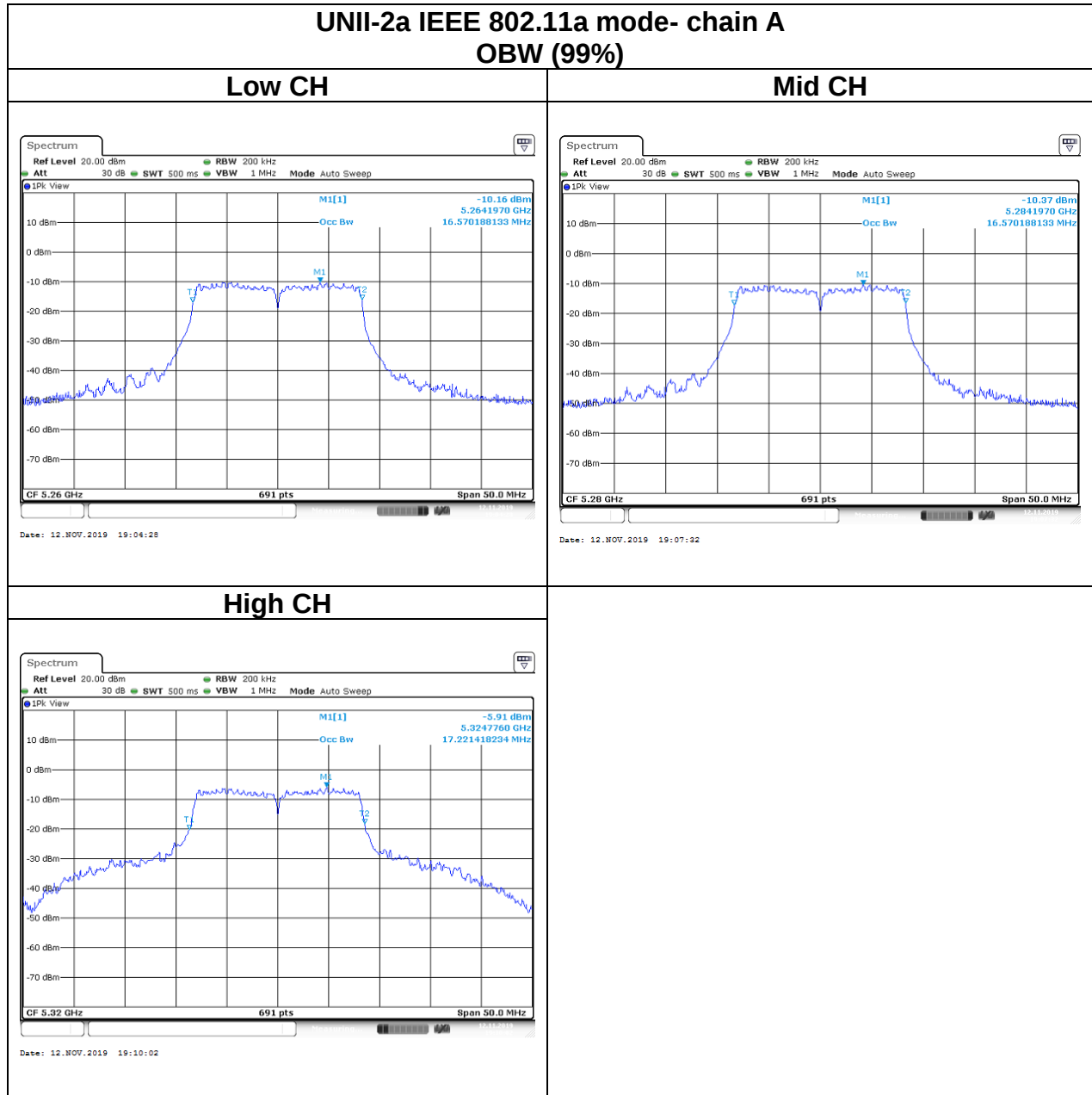


Report No.: T190902W03-RP4

Page: 54 / 251
Rev.: 02



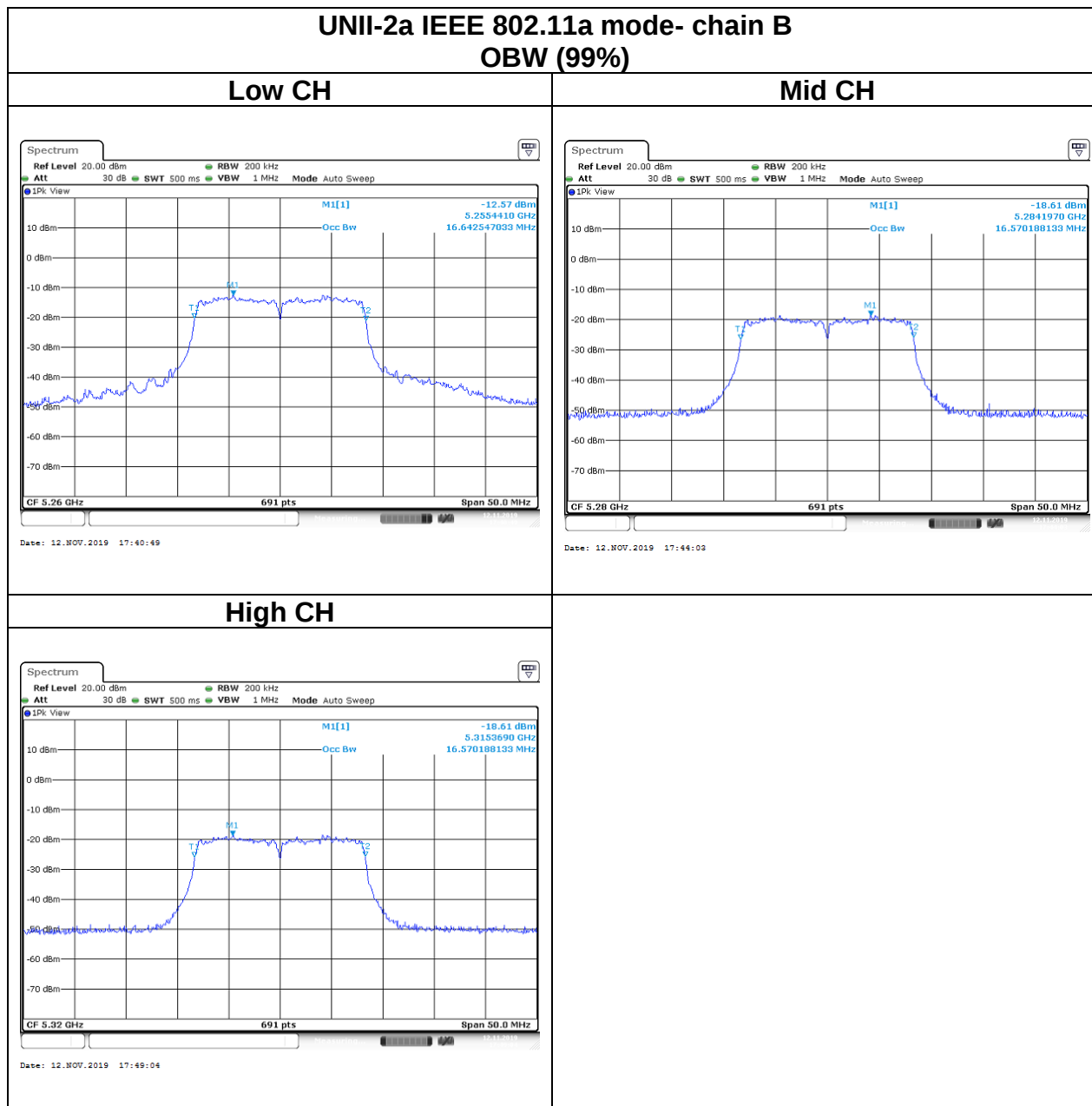
Test Data





Report No.: T190902W03-RP4

Page: 56 / 251
Rev.: 02



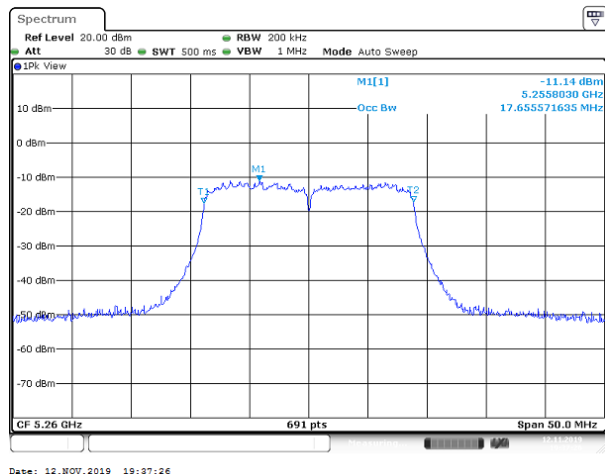


Report No.: T190902W03-RP4

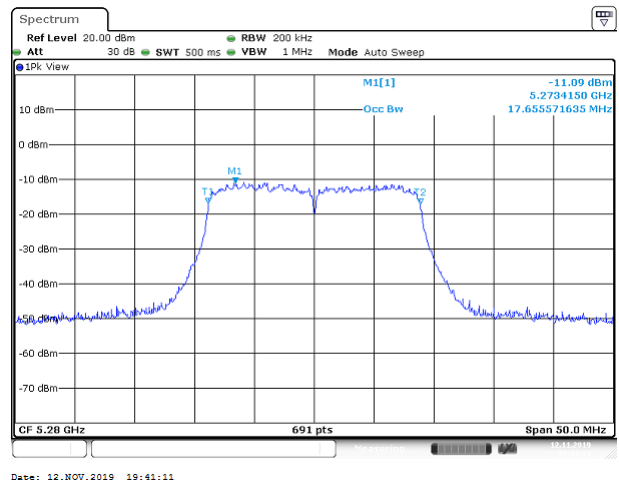
Page: 57 / 251
Rev.: 02

UNII-2a IEEE 802.11n HT20 mode- chain A OBW (99%)

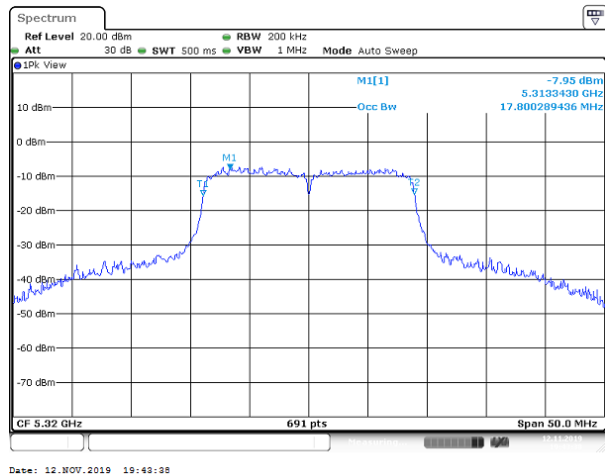
Low CH

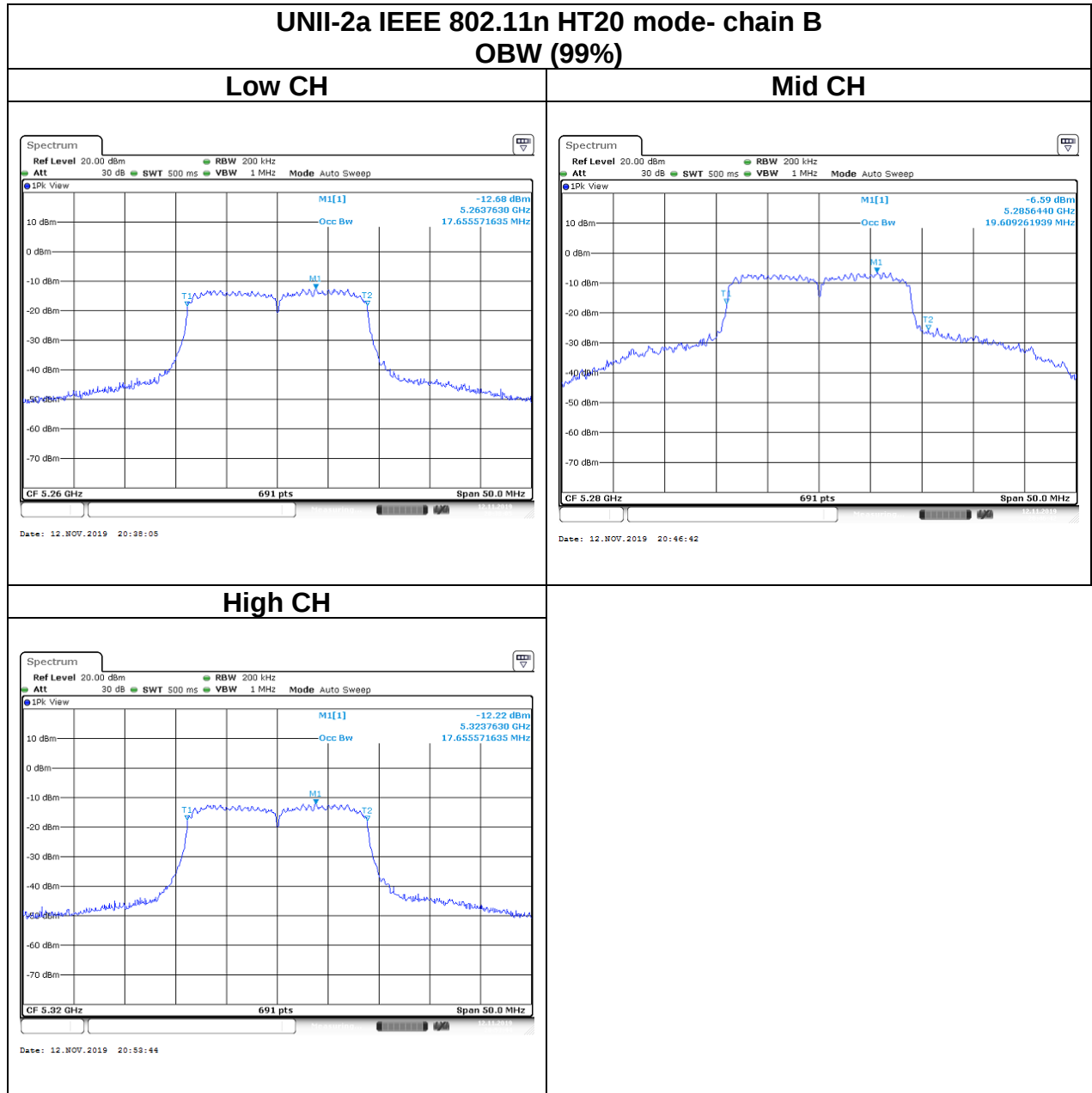


Mid CH



High CH

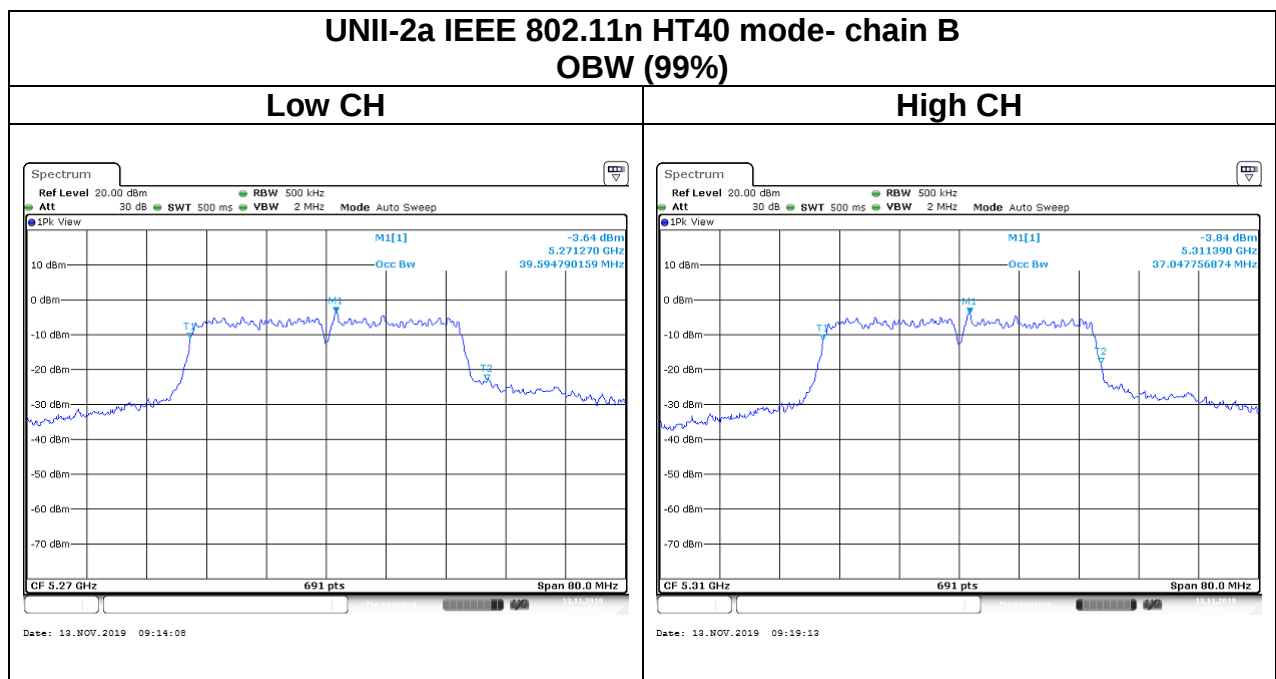
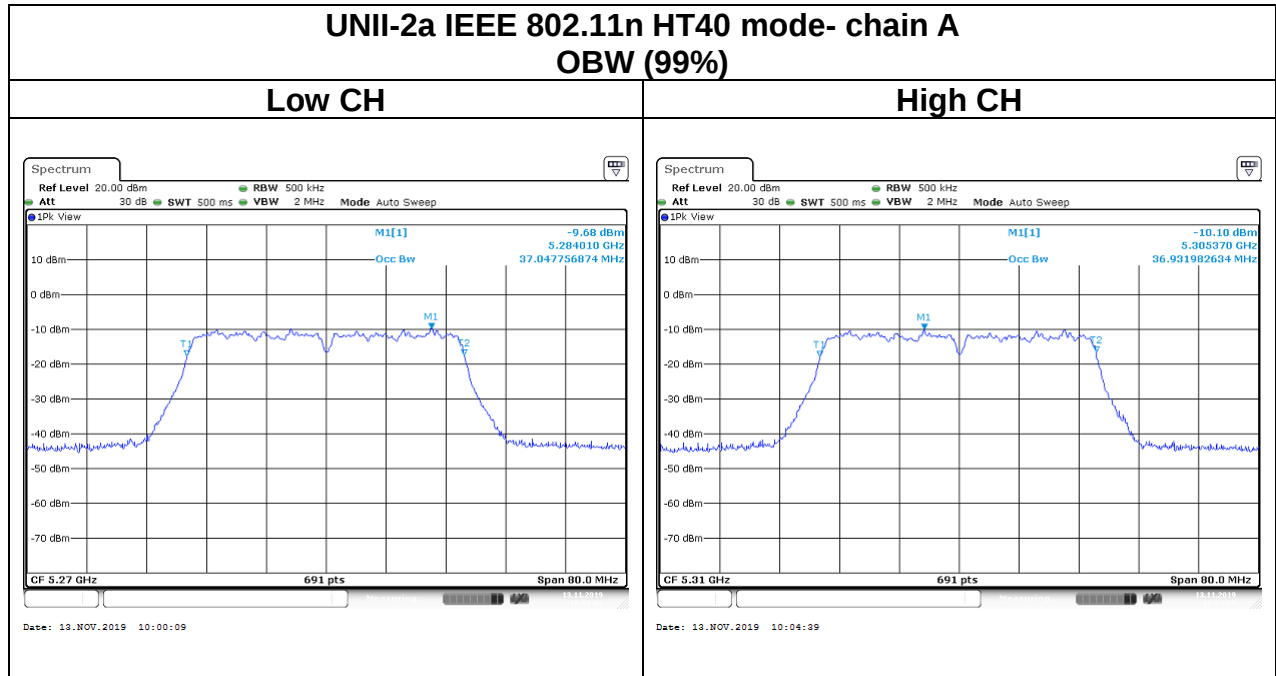






Report No.: T190902W03-RP4

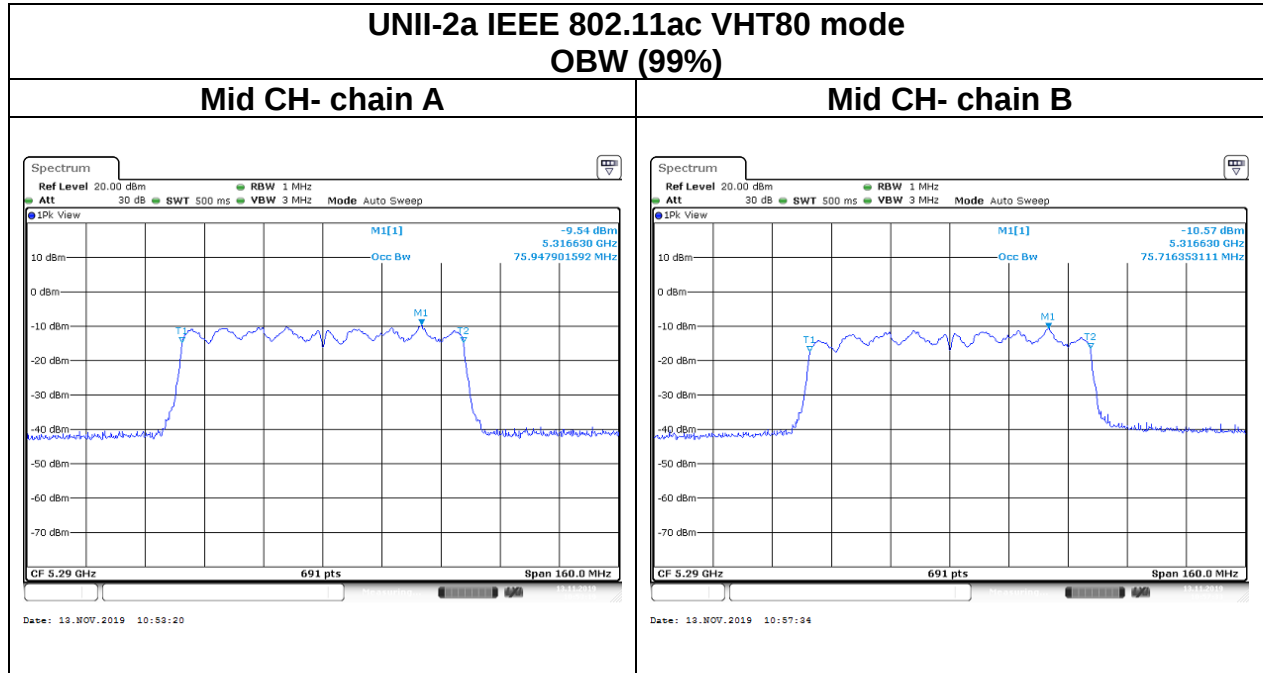
Page: 59 / 251
Rev.: 02



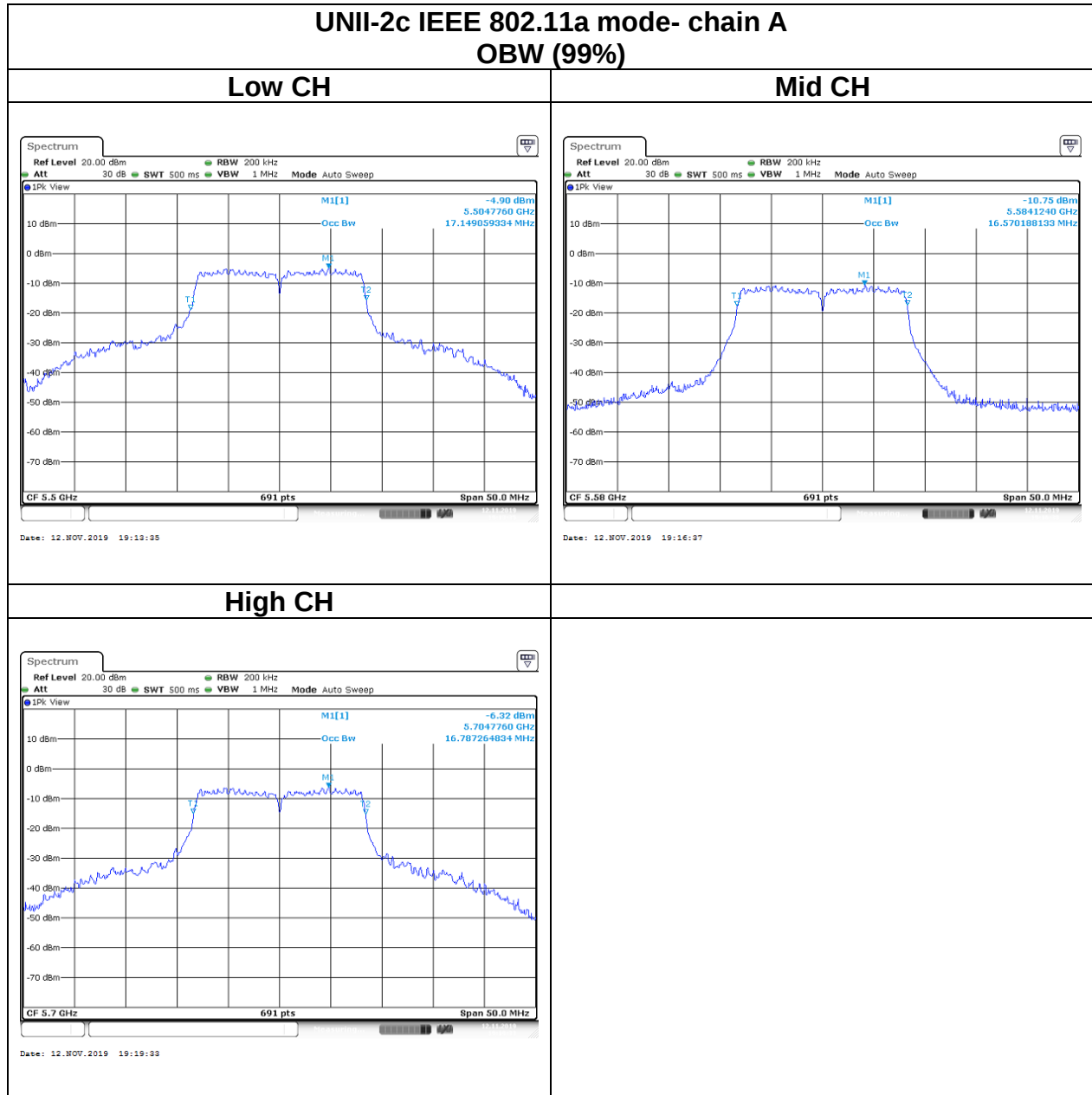


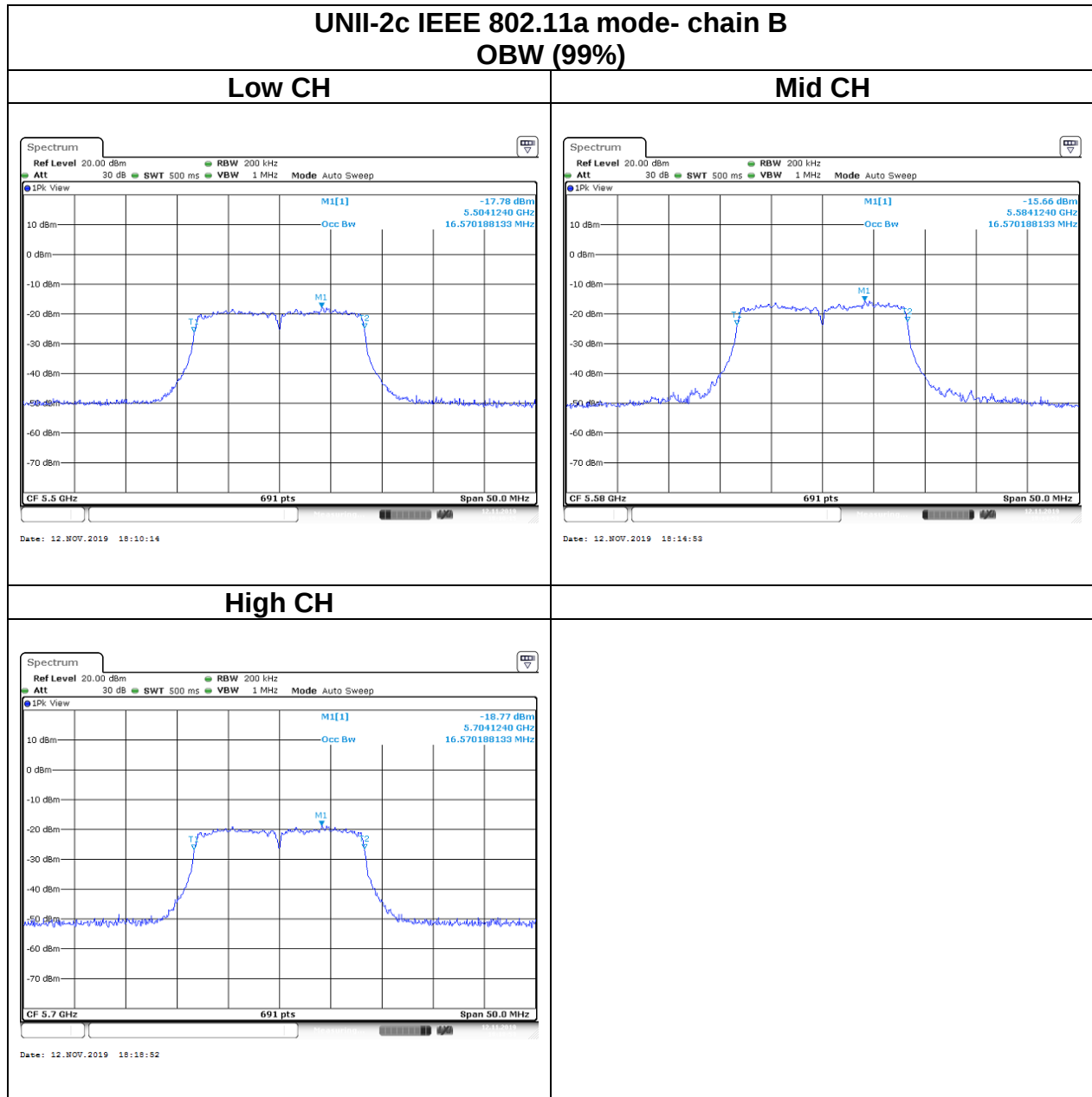
Report No.: T190902W03-RP4

Page: 60 / 251
Rev.: 02



Test Data

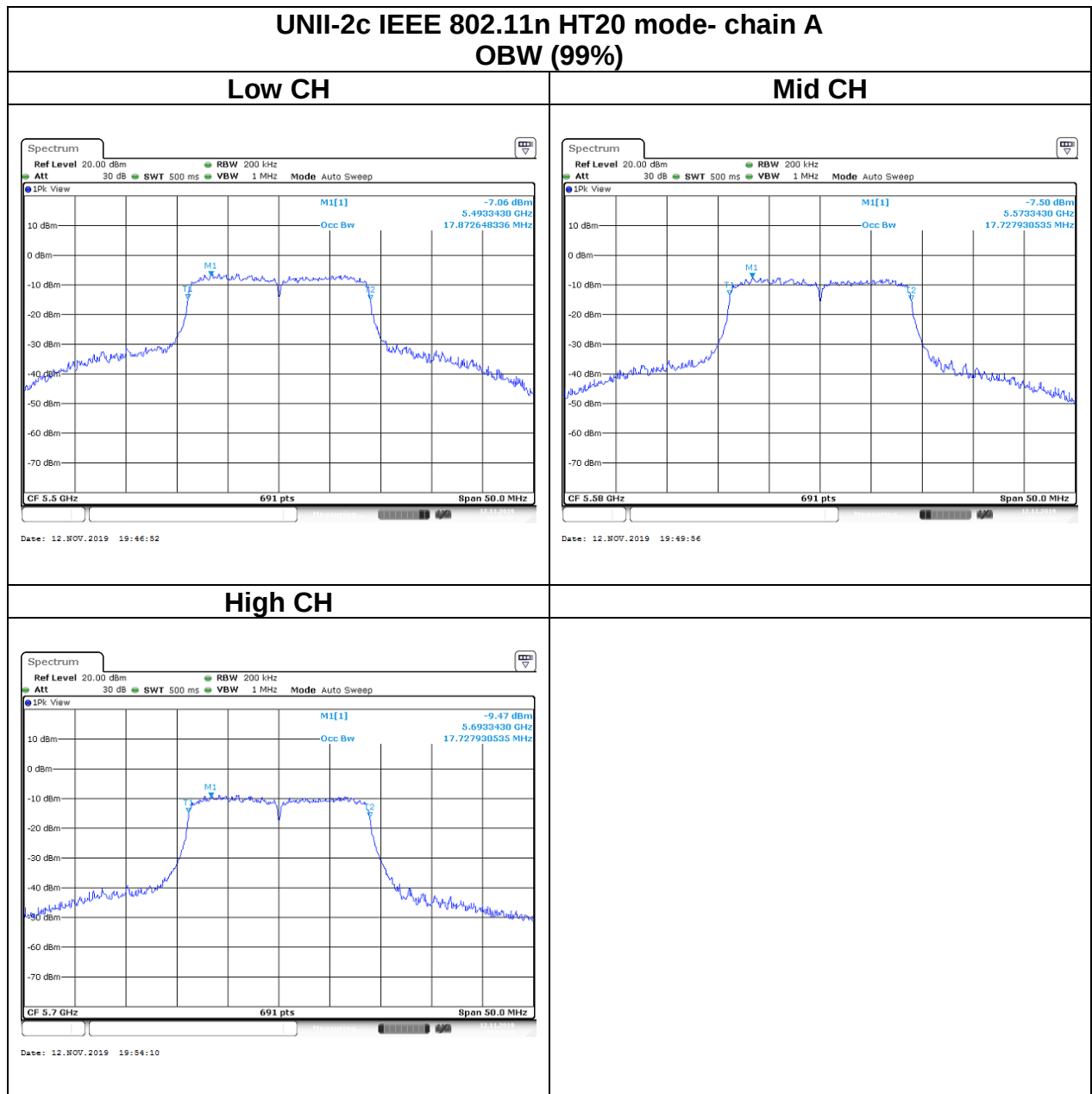


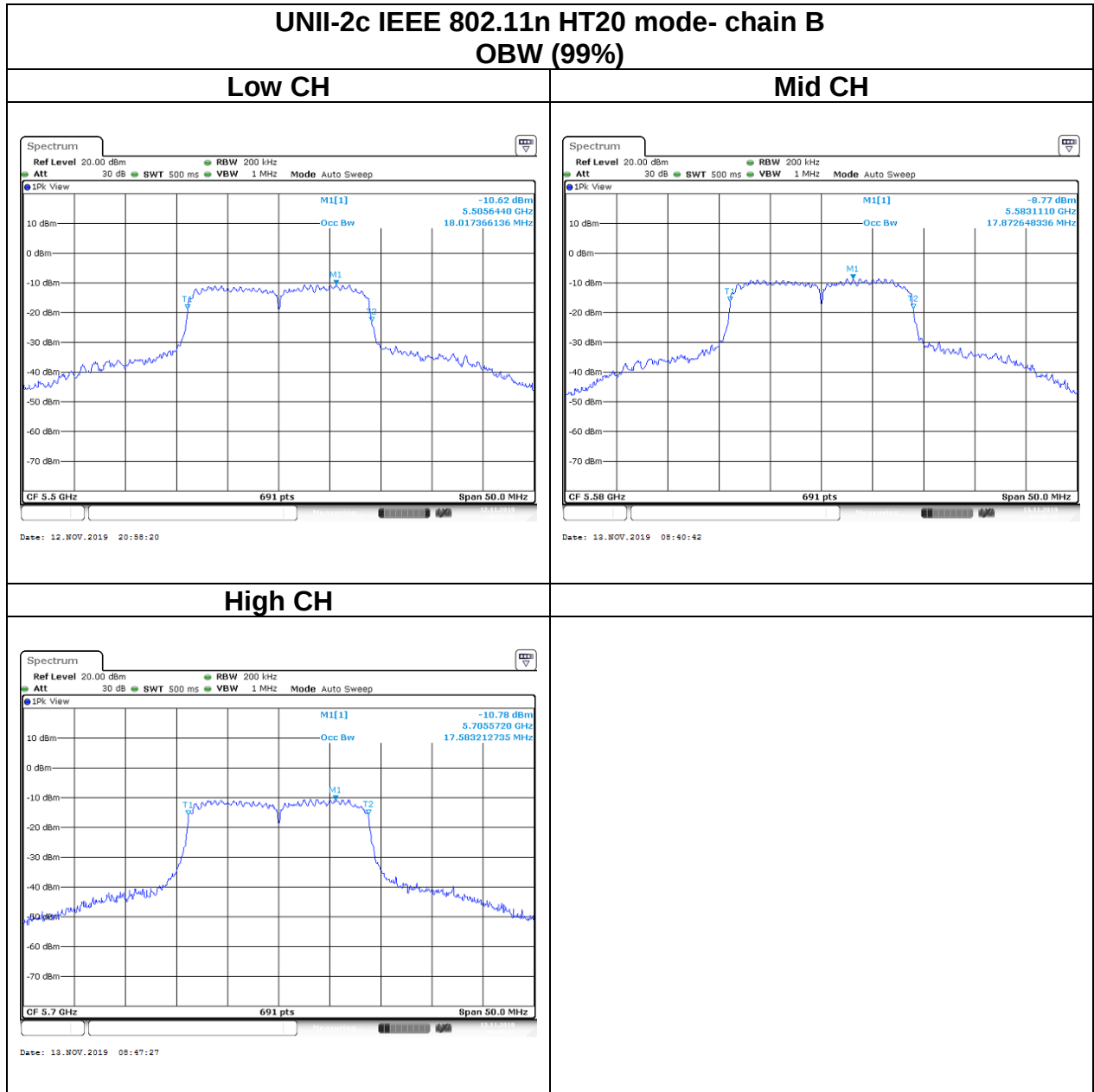




Report No.: T190902W03-RP4

Page: 63 / 251
Rev.: 02

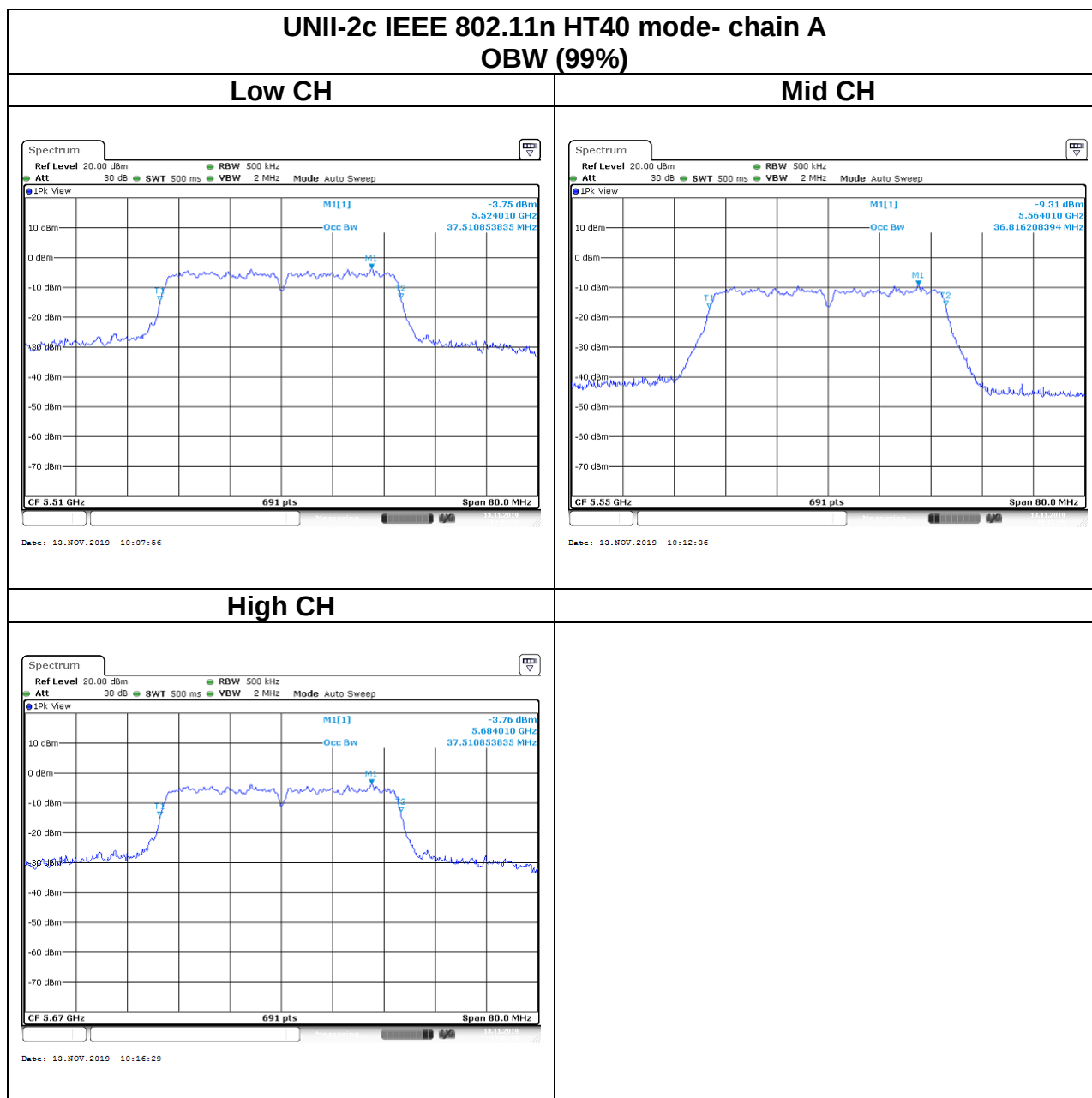






Report No.: T190902W03-RP4

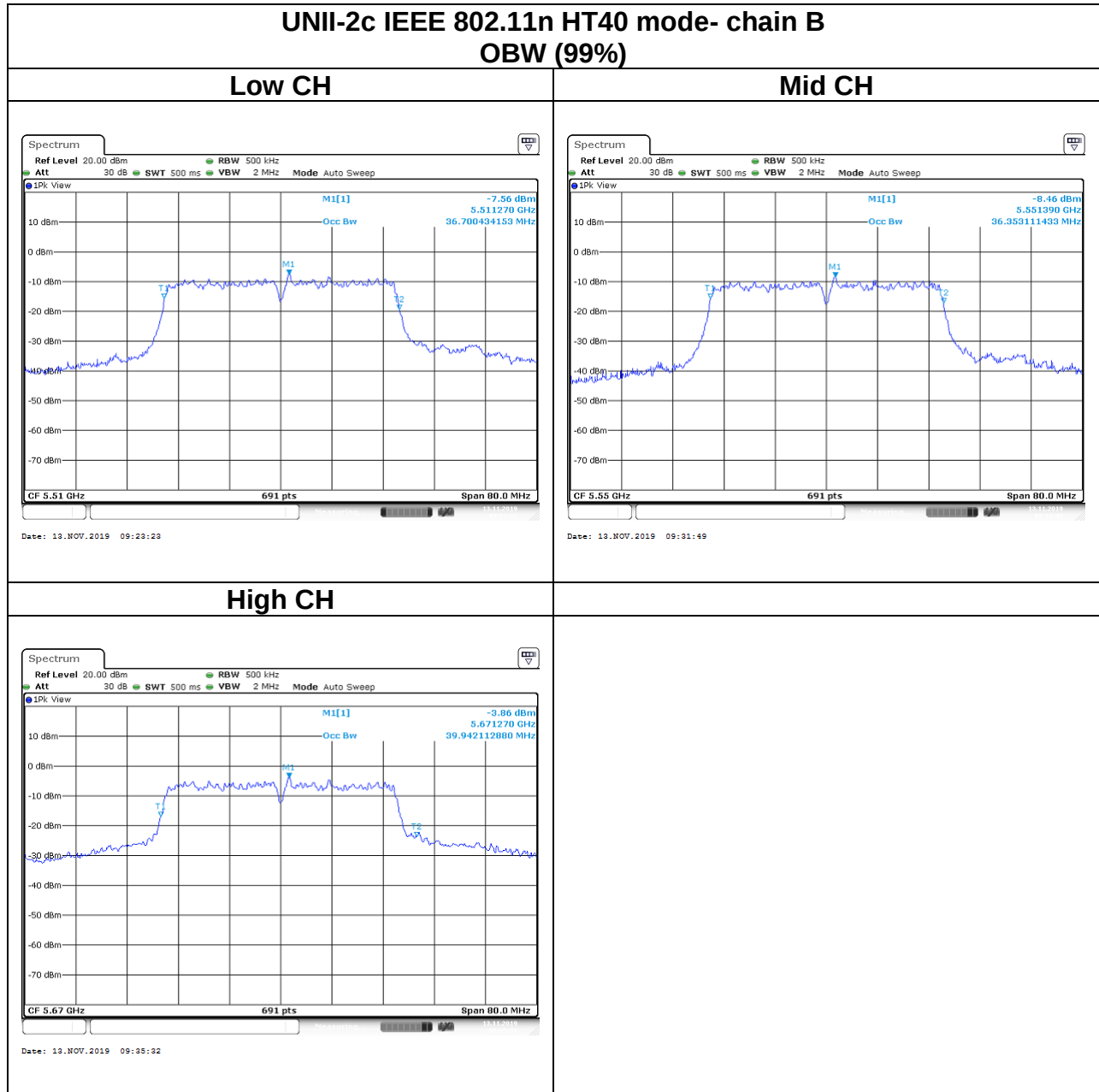
Page: 65 / 251
Rev.: 02





Report No.: T190902W03-RP4

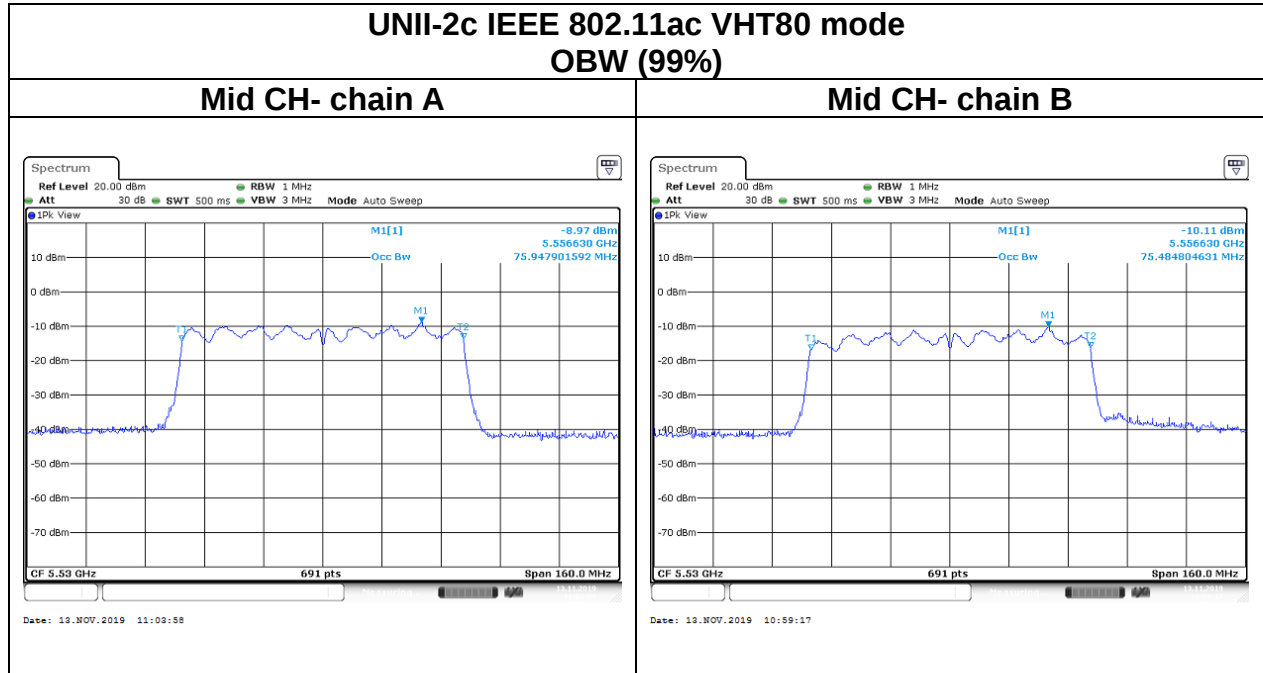
Page: 66 / 251
Rev.: 02





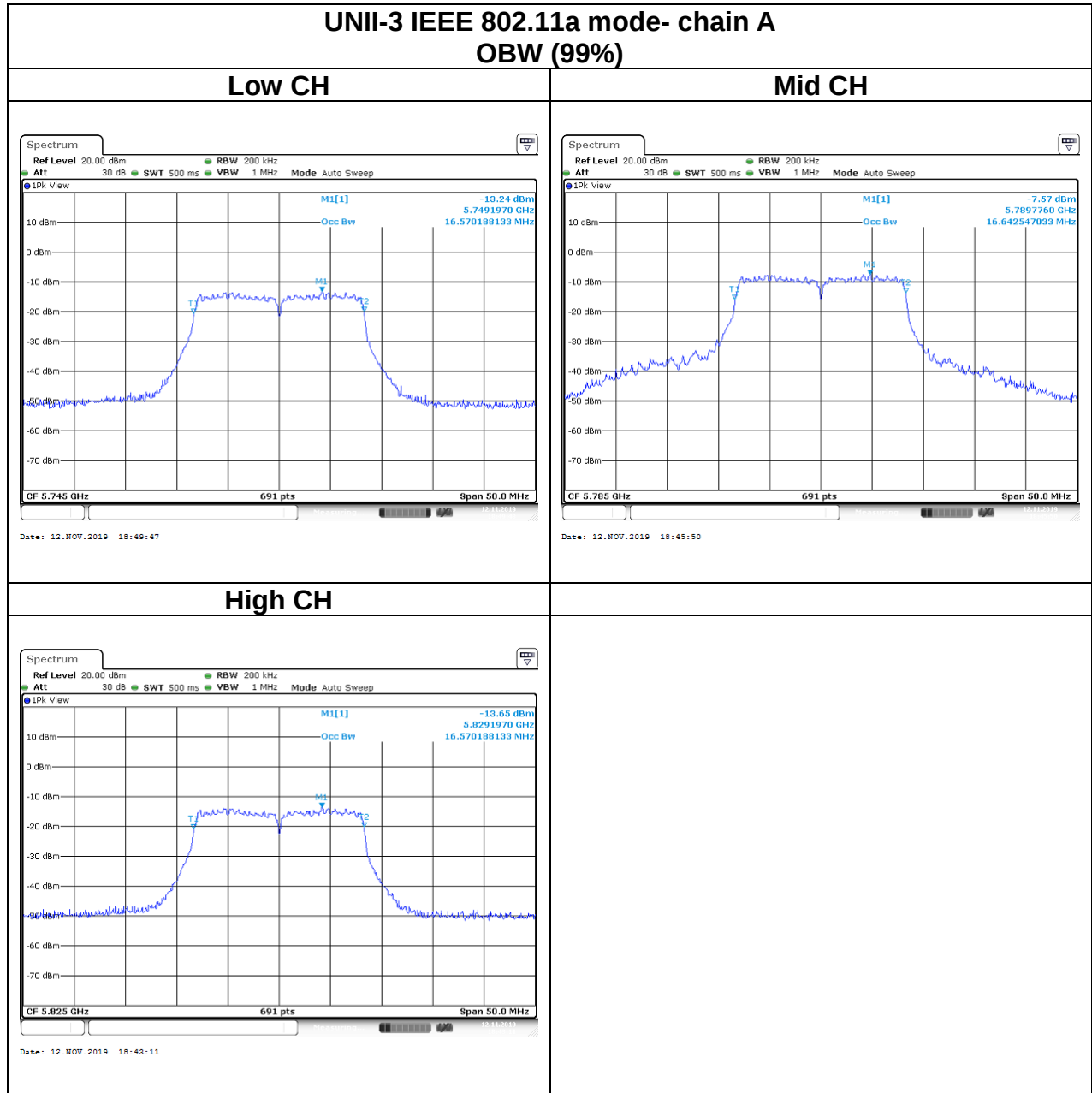
Report No.: T190902W03-RP4

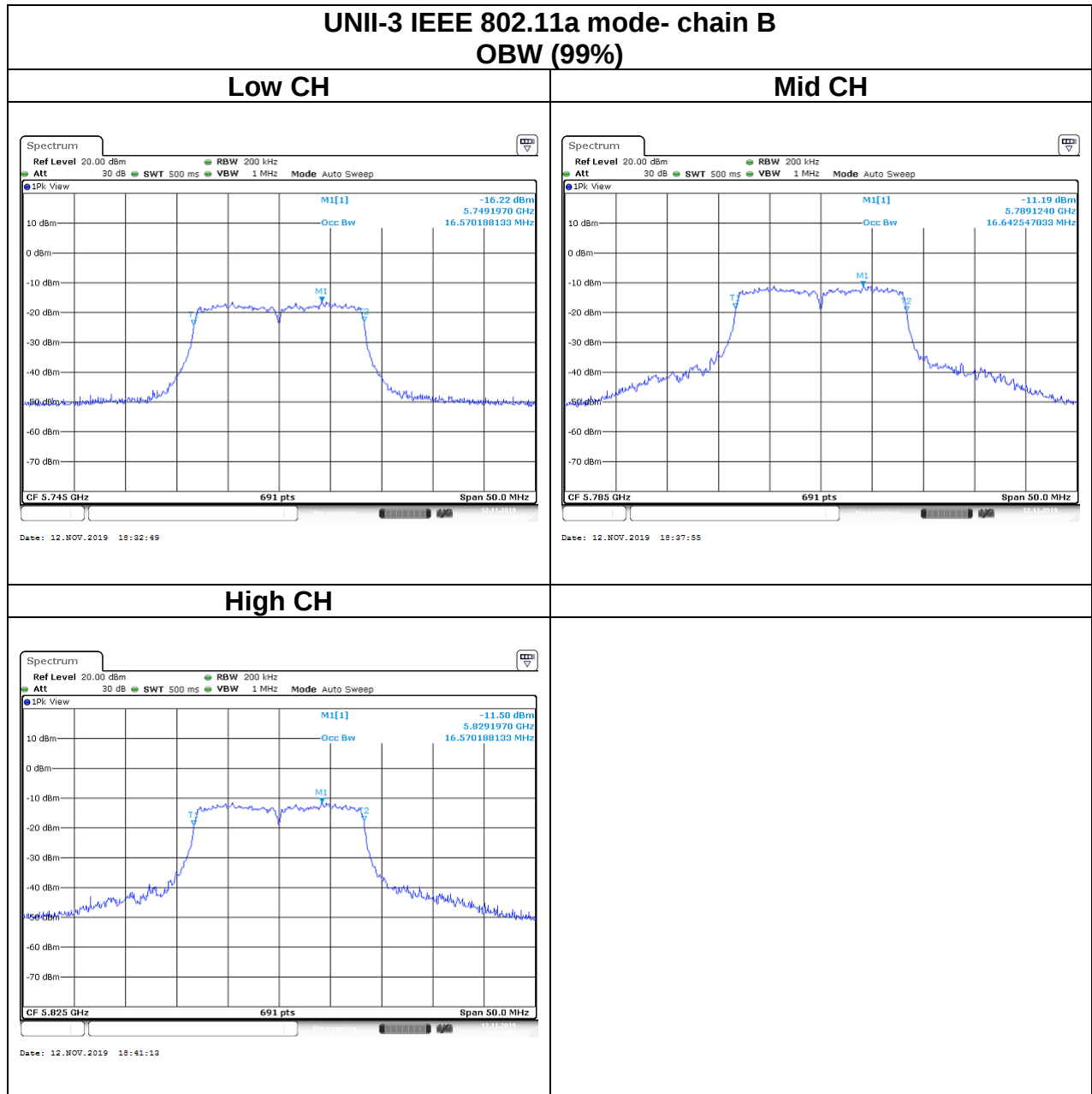
Page: 67 / 251
Rev.: 02



Report No.: T190902W03-RP4

Test Data

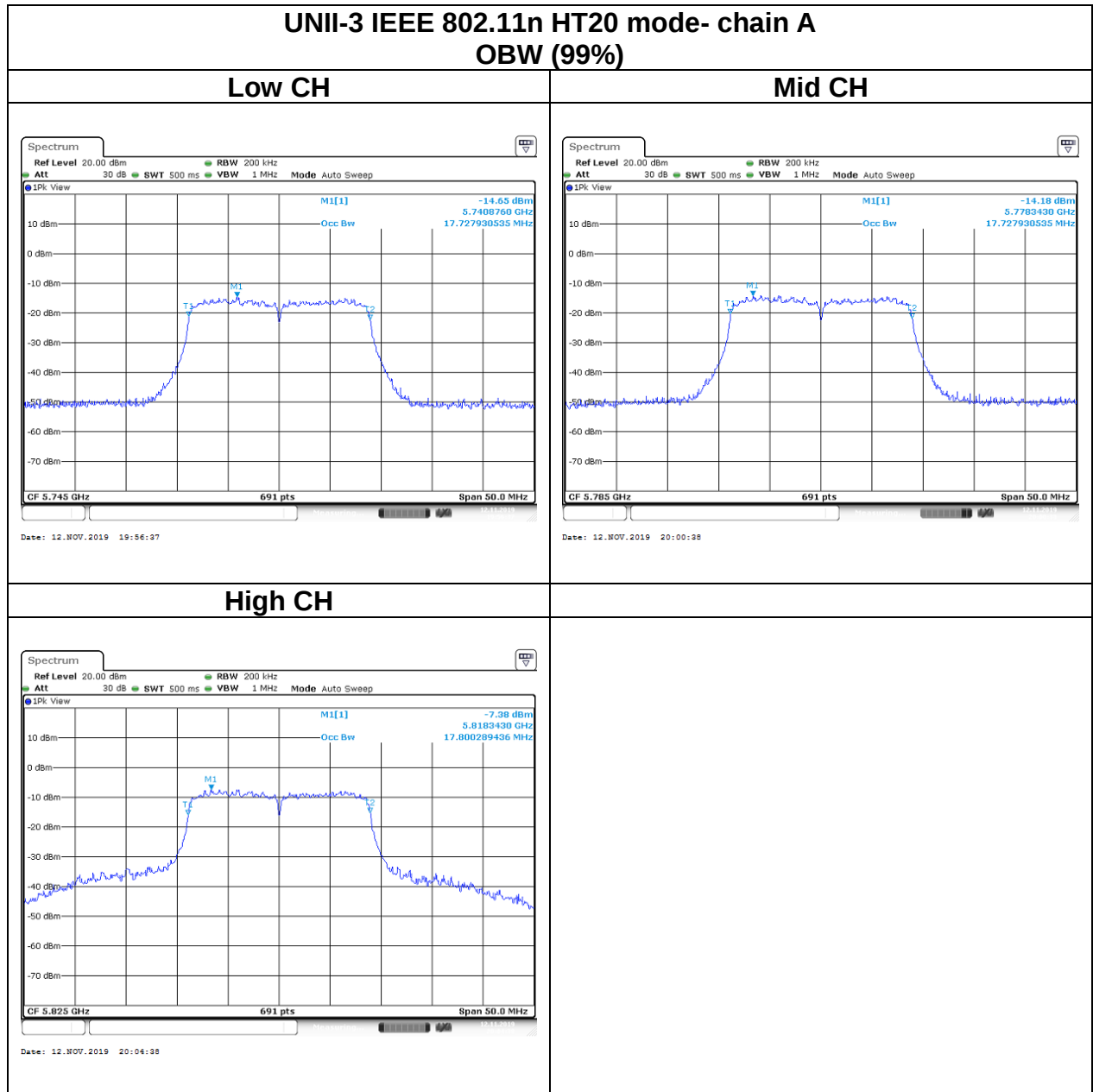






Report No.: T190902W03-RP4

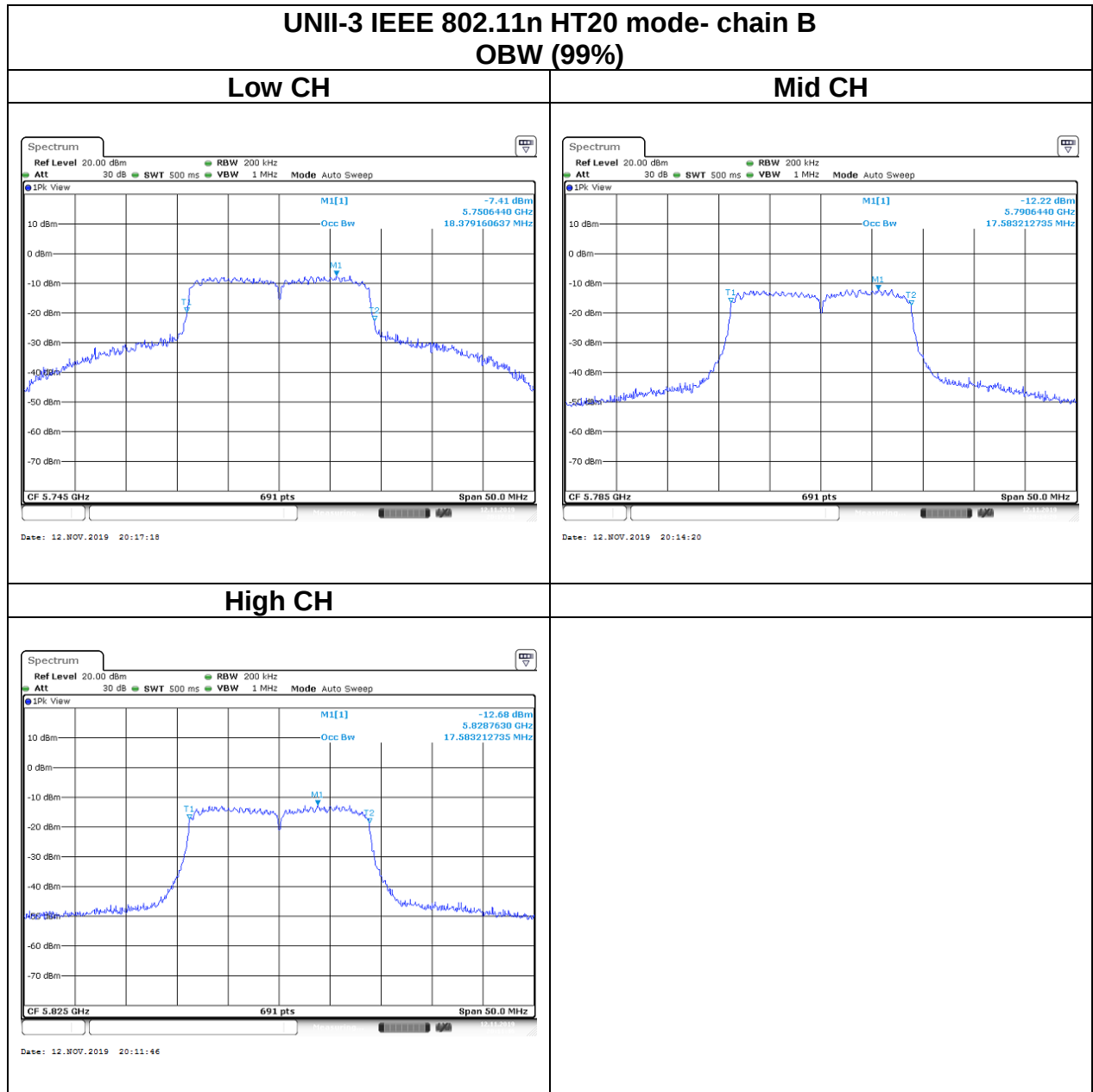
Page: 70 / 251
Rev.: 02





Report No.: T190902W03-RP4

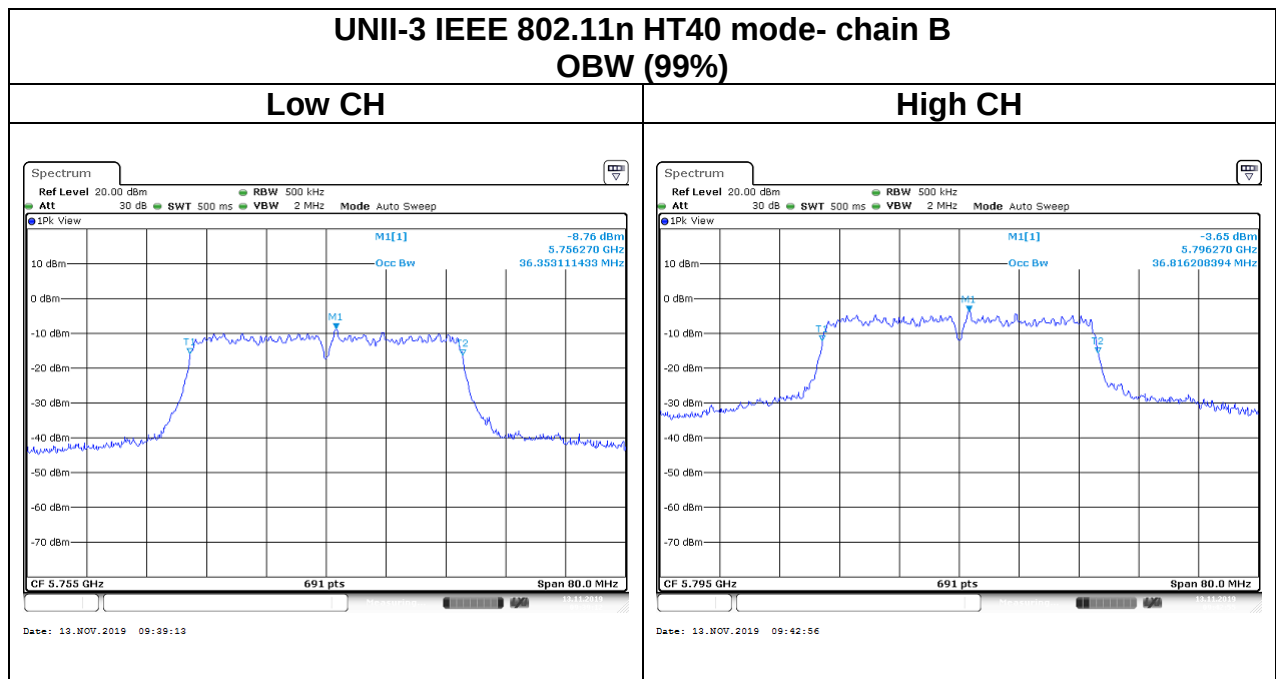
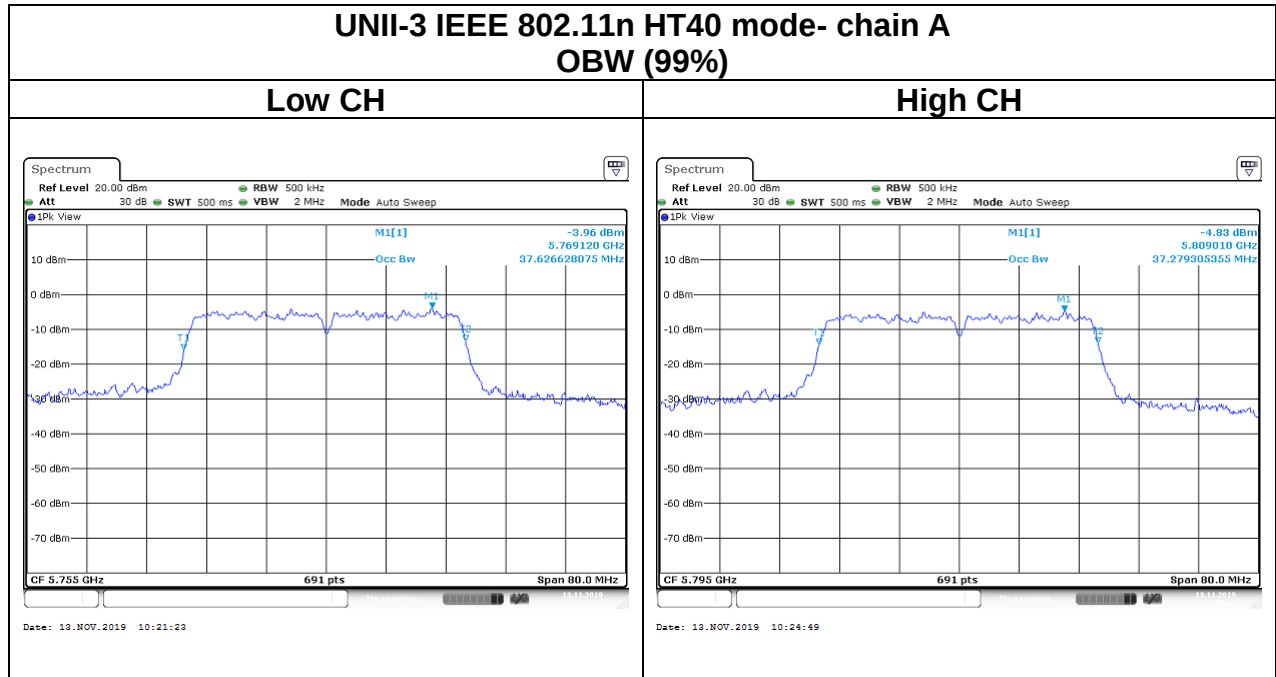
Page: 71 / 251
Rev.: 02

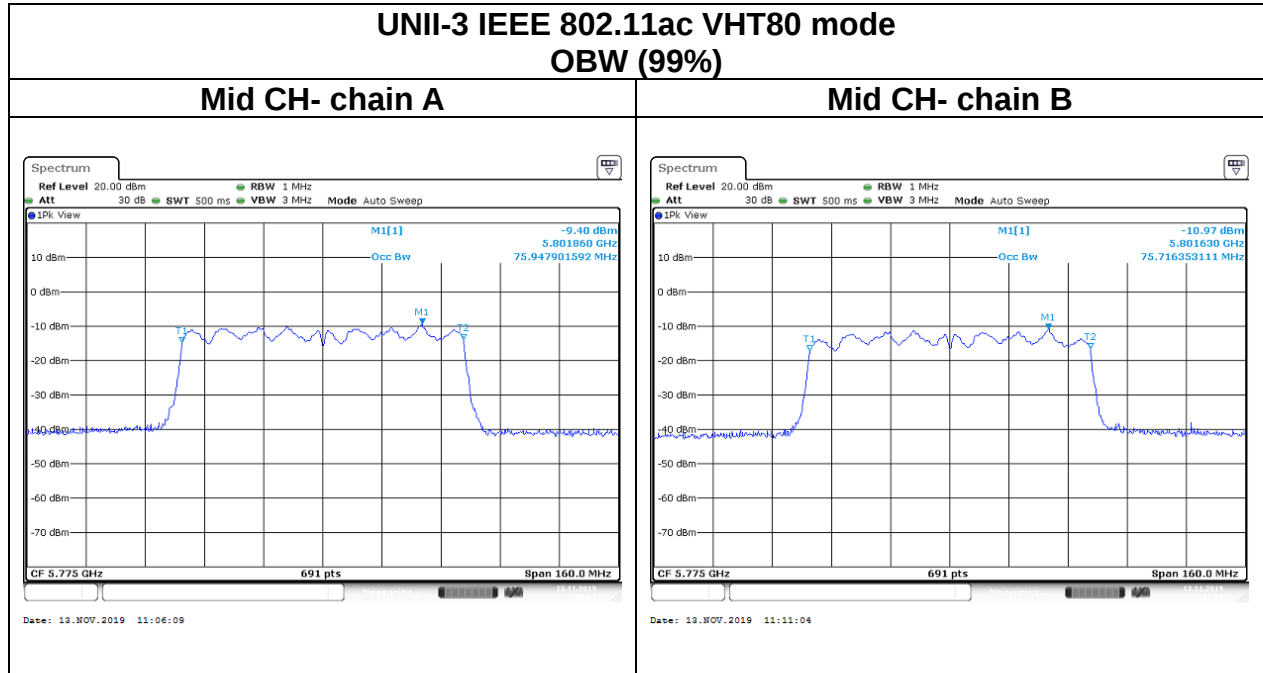




Report No.: T190902W03-RP4

Page: 72 / 251
Rev.: 02





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.

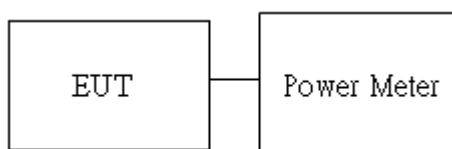
UNII-1 Limit	☒ Antenna not exceed 6 dBi : 24dBm ☐ Antenna with DG greater than 6 dBi : [Limit = $24 - (DG - 6)$]
UNII-2a/2c Limit	☒ Antenna not exceed 6 dBi : 24dBm ☐ Antenna with DG greater than 6 dBi : [Limit = $24 - (DG - 6)$]
UNII-3 Limit	☒ Antenna not exceed 6 dBi : 30dBm ☐ Antenna with DG greater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

4.3.2 Test Procedure

Test method Refer as KDB 789033 D02.

1. The EUT RF output connected to the power meter 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



4.3.4 Test Result

Conducted output power :

UNII-1									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a Data rate: 6Mbps	36	5180	50.00	49.00	16.91	16.05	19.51	0.0894	24
	44	5220	51.00	50.00	16.20	16.68	19.46	0.0882	
	48	5240	51.00	50.00	15.95	16.46	19.22	0.0836	
IEEE 802.11n 20 MHz Data rate: MCS8	36	5180	30.00	28.00	16.91	16.94	19.94	0.0985	
	44	5220	32.00	30.00	16.84	16.31	19.59	0.0911	
	48	5240	31.00	30.00	17.95	16.25	20.19	0.1045	
IEEE 802.11n 40 MHz Data rate: MCS8	38	5190	28.00	27.00	17.86	16.51	20.25	0.1059	
	46	5230	28.00	27.00	17.81	16.62	20.27	0.1063	
IEEE 802.11ac VHT80 Data rate: MCS8	42	5210	34	33	17.92	16.68	20.35	0.1085	



Report No.: T190902W03-RP4

Page: 77 / 251
Rev.: 02

UNII-2a									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a Data rate: 6Mbps	52	5260	51	49	16.52	16.51	19.53	0.0896	24
	56	5280	51	49	16.46	16.17	19.33	0.0857	
	64	5320	51	49	16.32	16.1	19.22	0.0836	
IEEE 802.11n 20 MHz Data rate: MCS8	52	5260	34	31	19.35	18.25	21.85	0.1529	
	56	5280	36	33	19.21	17.29	21.37	0.1369	
	64	5320	36	33	18.19	17.86	21.04	0.1270	
IEEE 802.11n 40 MHz Data rate: MCS8	54	5270	35	33	19.73	18.65	22.23	0.1673	
	62	5310	35	33	18.52	17.82	21.19	0.1317	
IEEE 802.11ac VHT80 Data rate: MCS8	58	5290	33	31	19.33	17.98	21.72	0.1485	

UNII-2c									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a Data rate: 6Mbps	100	5500	48	49	16.26	17.80	20.11	0.1025	24
	116	5580	50	46	16.69	16.28	19.50	0.0891	
	140	5700	50	44	16.21	15.41	18.84	0.0765	
IEEE 802.11n 20 MHz Data rate: MCS8	100	5500	33	33	19.76	19.91	22.85	0.1926	
	116	5580	35	30	18.32	18.30	21.32	0.1355	
	140	5700	35	28	18.92	19.14	22.04	0.1600	
IEEE 802.11n 40 MHz Data rate: MCS8	102	5510	32	33	19.33	19.94	22.66	0.1843	
	110	5550	34	34	19.62	19.71	22.68	0.1852	
	134	5670	34	28	18.76	18.06	21.43	0.1391	
IEEE 802.11ac VHT80 Data rate: MCS8	106	5530	31	30	16.20	17.02	19.64	0.0920	



Report No.: T190902W03-RP4

Page: 79 / 251
Rev.: 02

UNII-3									
Config	CH	Freq. (MHz)	Power Set		AV Power(dBm)		AV Total Power (dBm)	AV Total Power (W)	Limit (dBm)
			chain0	chain1	chain0	chain1			
IEEE 802.11a Data rate: 6Mbps	149	5745	51	43	16.43	16.58	19.52	0.0895	30
	157	5785	52	44	16.42	16.70	19.57	0.0906	
	165	5825	49	43	16.15	15.41	18.81	0.0760	
IEEE 802.11n 20 MHz Data rate: MCS8	149	5745	36	27	19.62	18.07	21.92	0.1557	
	157	5785	37	28	20.79	19.05	23.02	0.2003	
	165	5825	34	27	19.05	18.28	21.69	0.1477	
IEEE 802.11n 40 MHz Data rate: MCS8	151	5755	35	27	19.75	18.10	22.01	0.1590	
	159	5795	36	28	18.21	18.53	21.38	0.1375	
IEEE 802.11ac VHT80 Data rate: MCS8	155	5775	33	25	17.36	18.19	20.81	0.1204	

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.

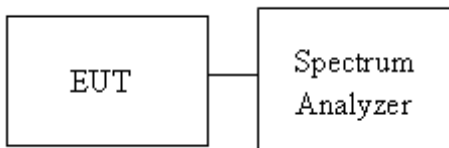
UNII-1 Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-2a Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater than 6 dBi : [Limit = 11 – (DG – 6)]
UNII-2c Limit	☒ Antenna not exceed 6 dBi : 11 dBm ☐ Antenna with DG greater 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					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5180	-1.34	-3.24	0.82	11
Mid	5220	-0.21	-2.33	1.87	
High	5240	-0.24	-2.01	1.97	
Test mode: IEEE 802.11n 20 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5180	-1.43	0.93	2.92	11
Mid	5220	-1.06	1.77	3.59	
High	5240	-0.49	2.13	4.02	
Test mode: IEEE 802.11n 40 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5190	0.7	-0.98	2.95	11
High	5230	1.03	-0.94	3.17	
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	-7.68	-9.98	-5.67	11

UNII-2a					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5260	-0.36	-2.73	1.63	11
Mid	5280	-0.49	-1.37	2.10	
High	5320	-0.75	-1.52	1.89	
Test mode: IEEE 802.11n 20 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5260	-1.5	-2.29	1.13	11
Mid	5280	-1.52	-2.16	1.18	
High	5320	-1.91	-2.27	0.92	
Test mode: IEEE 802.11n 40 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5270	0.98	-0.37	3.37	11
High	5310	0.82	-1.03	3.00	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Mid	5290	-7.17	-9.09	-5.01	11

UNII-2c					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5500	0.19	0.07	3.14	11
Mid	5580	-1.04	-0.1	2.47	
High	5700	-2.29	-0.58	1.66	
Test mode: IEEE 802.11n 20 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5500	-2.25	-1.05	1.40	11
Mid	5580	-1.97	0.34	2.35	
High	5700	0.88	-0.69	3.18	
Test mode: IEEE 802.11n 40 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5510	1.02	0.97	4.01	11
Mid	5550	1.37	-3.22	2.67	
High	5670	0.92	-0.72	3.19	
Test mode: IEEE 802.11ac VHT80 mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Mid	5530	-7.49	-9.11	-5.21	11



Report No.: T190902W03-RP4

Page: 85 / 251
Rev.: 02

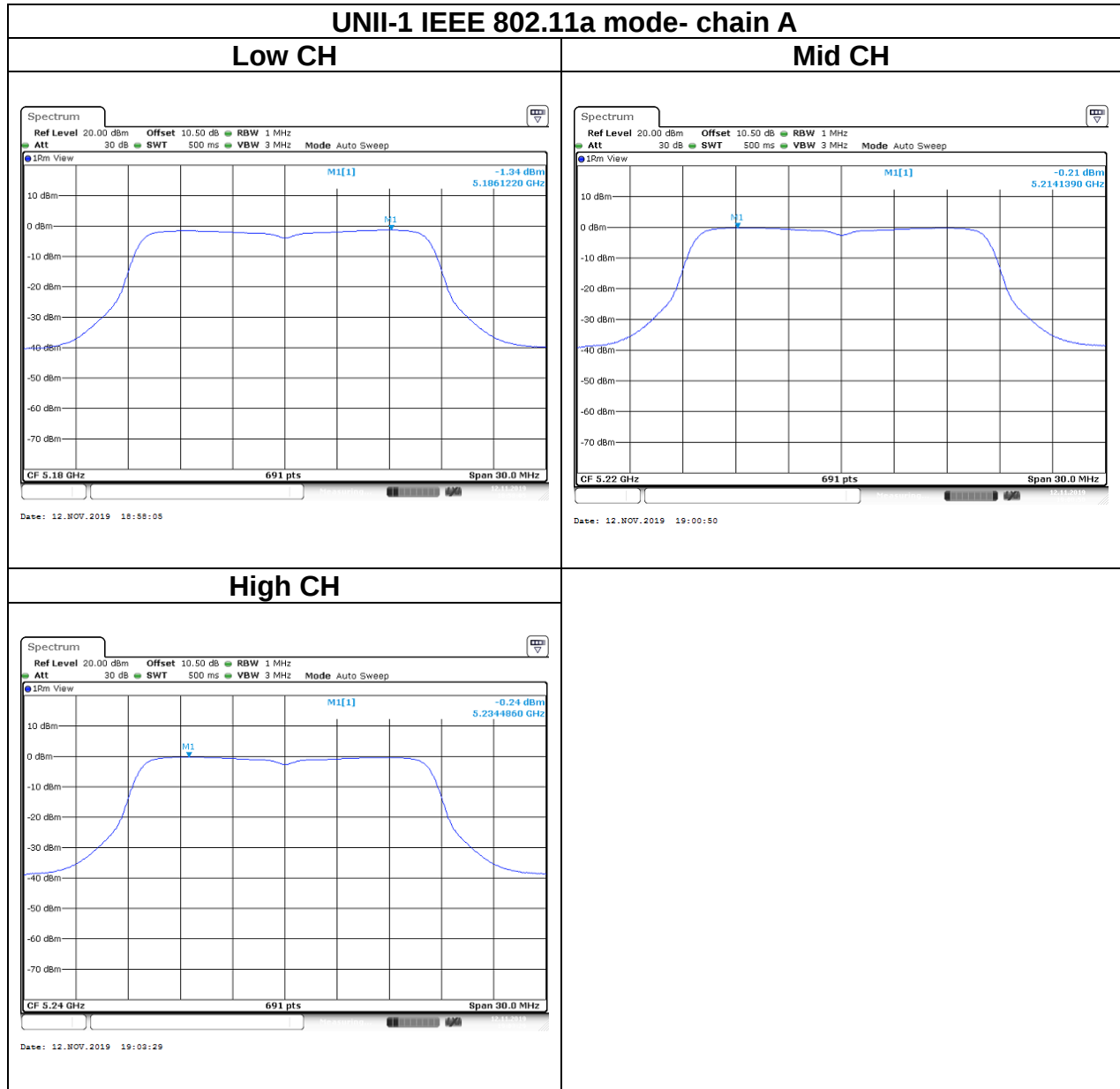
UNII-3					
Test mode: IEEE 802.11a mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5745	8.71	8.72	11.73	30
Mid	5785	8.33	8.12	11.24	
High	5825	7.81	7.46	10.65	
Test mode: IEEE 802.11n 20 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5745	6.37	7.79	10.15	30
Mid	5785	8.59	9.3	11.97	
High	5825	7.85	7.86	10.87	
Test mode: IEEE 802.11n 40 MHz mode					
Channel	Frequency (MHz)	Chain 0 PPSD (dBm)	Chain 1 PPSD (dBm)	Total PPSD (dBm)	Limit (dBm)
Low	5755	6.19	6.24	9.23	30
High	5795	5.43	6.91	9.24	
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	-1.81	-3.88	0.29	30



Report No.: T190902W03-RP4

Page: 86 / 251
Rev.: 02

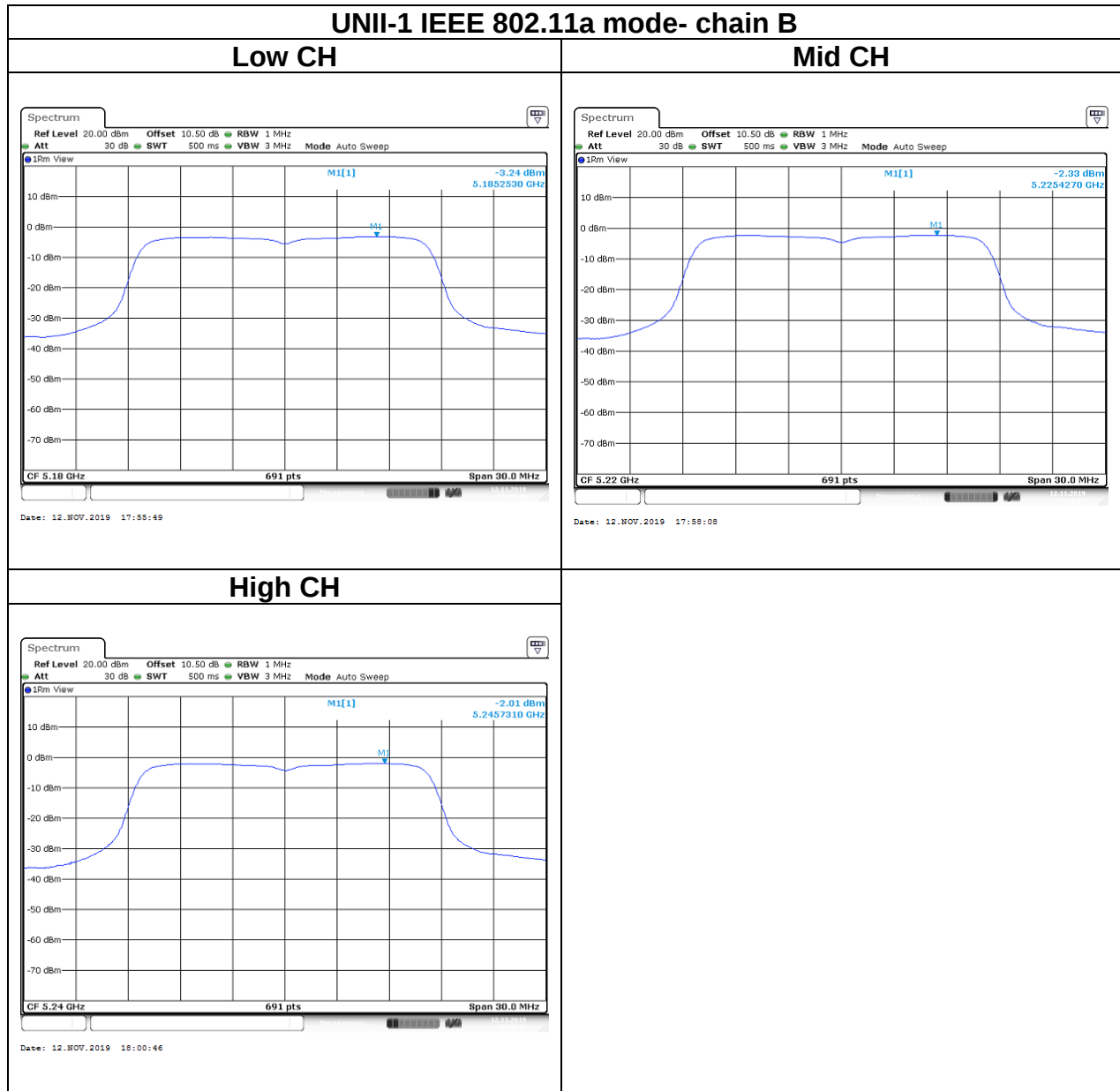
Test Data





Report No.: T190902W03-RP4

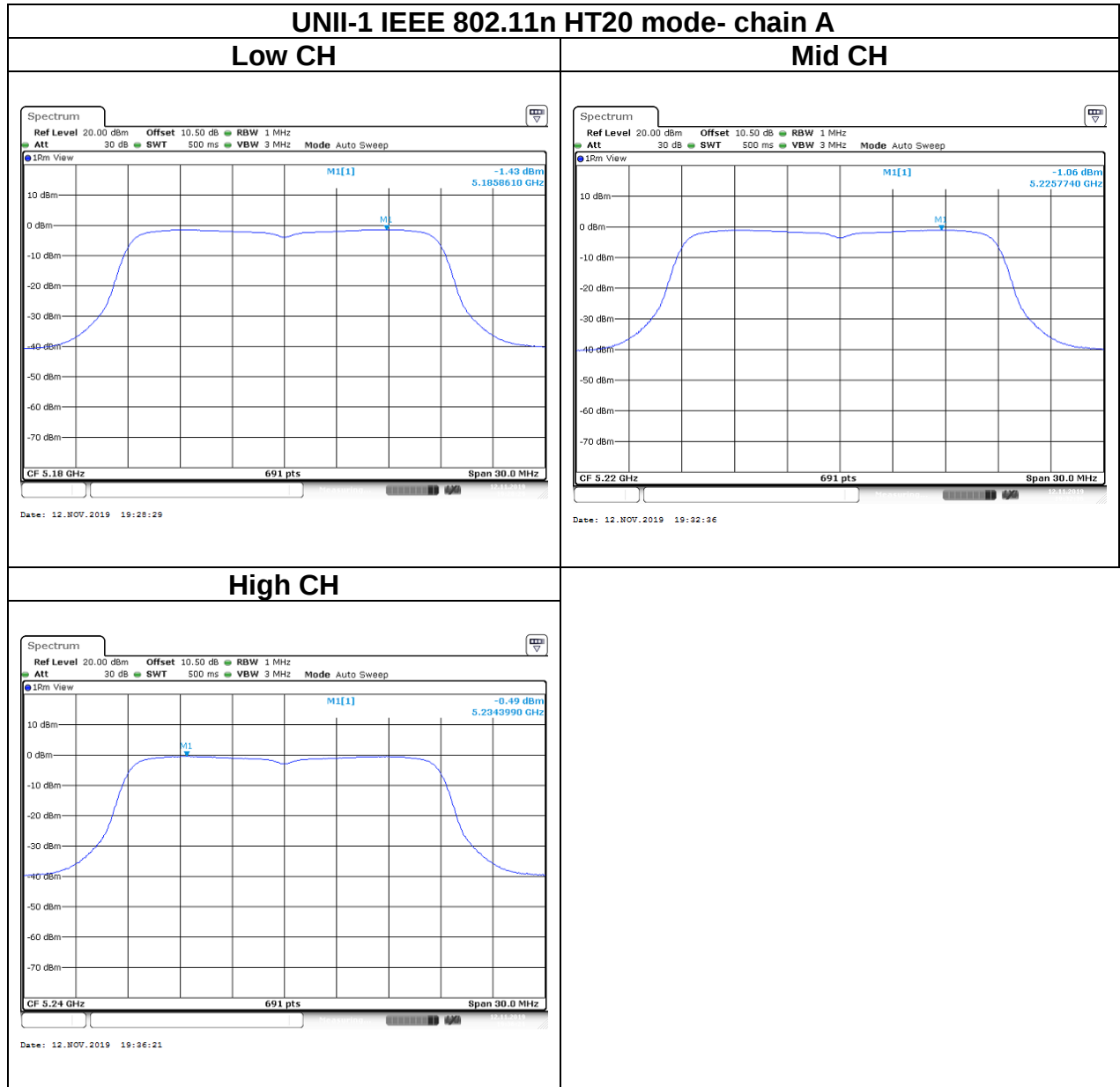
Page: 87 / 251
Rev.: 02





Report No.: T190902W03-RP4

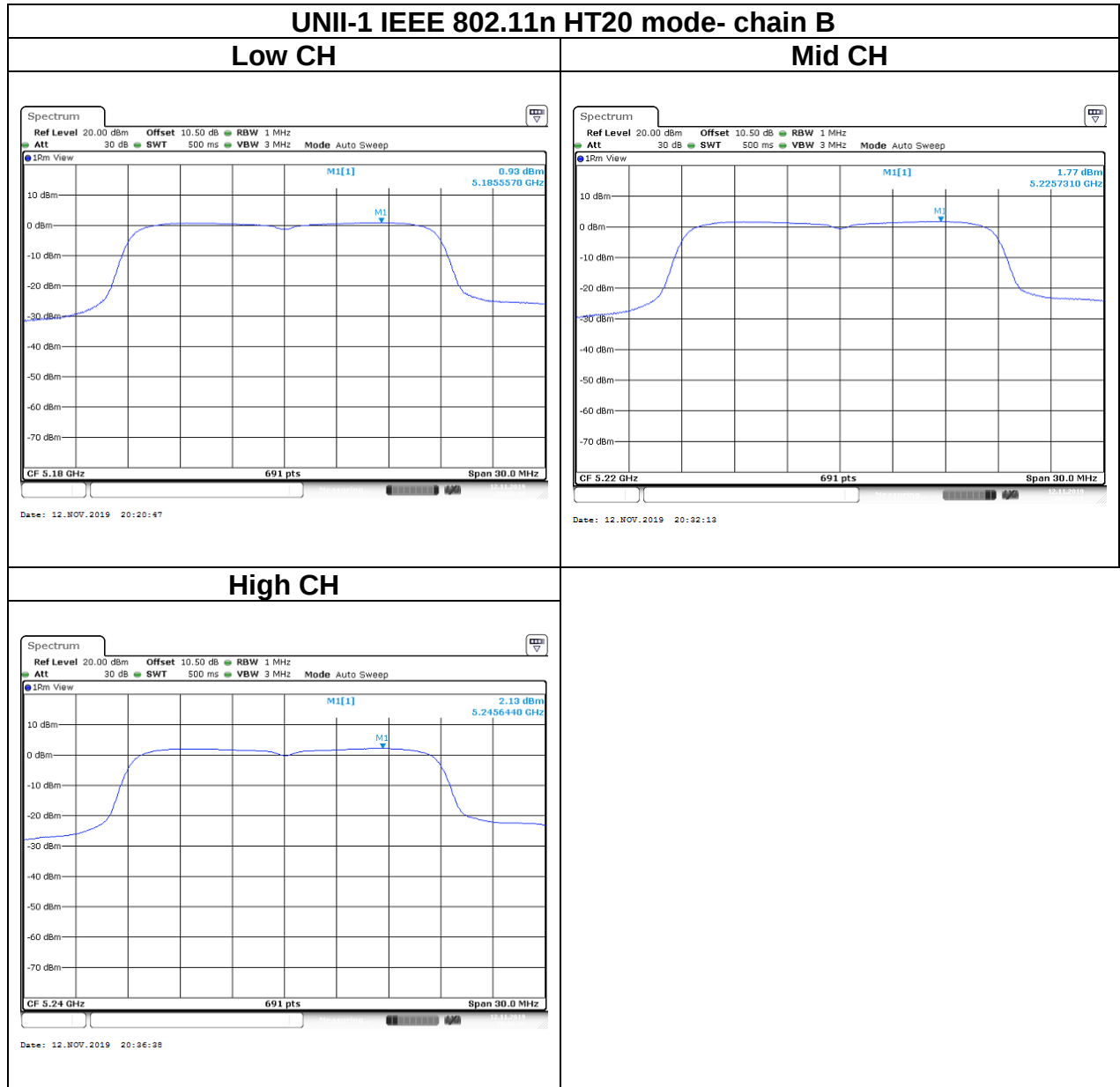
Page: 88 / 251
Rev.: 02

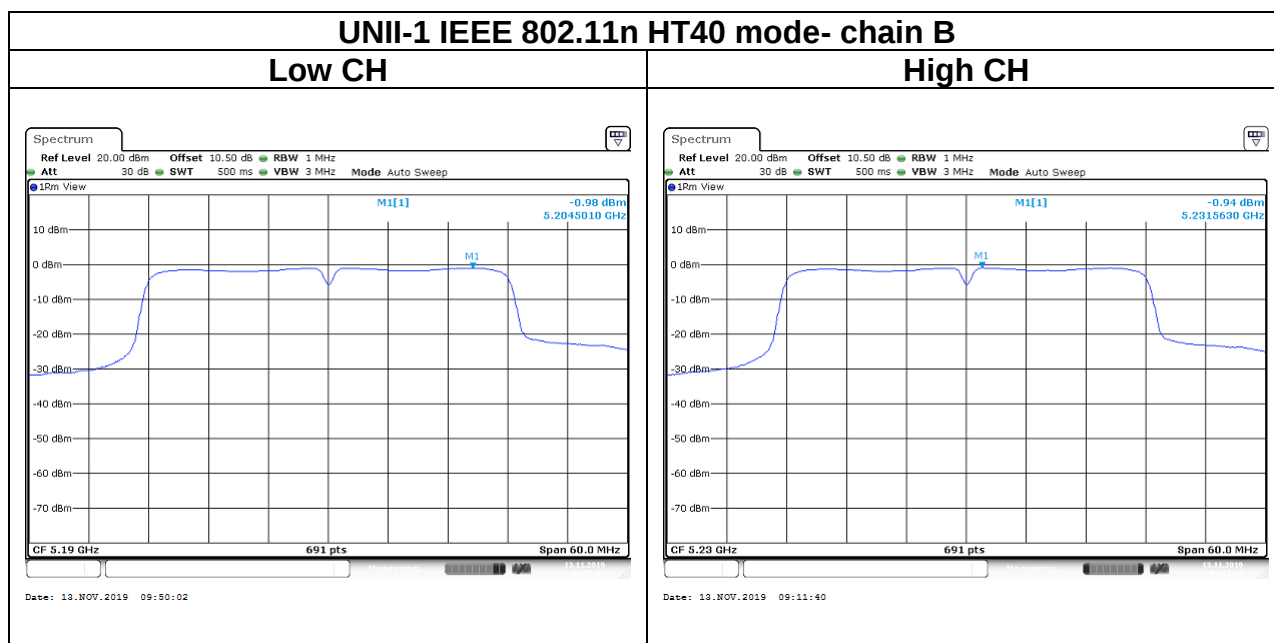
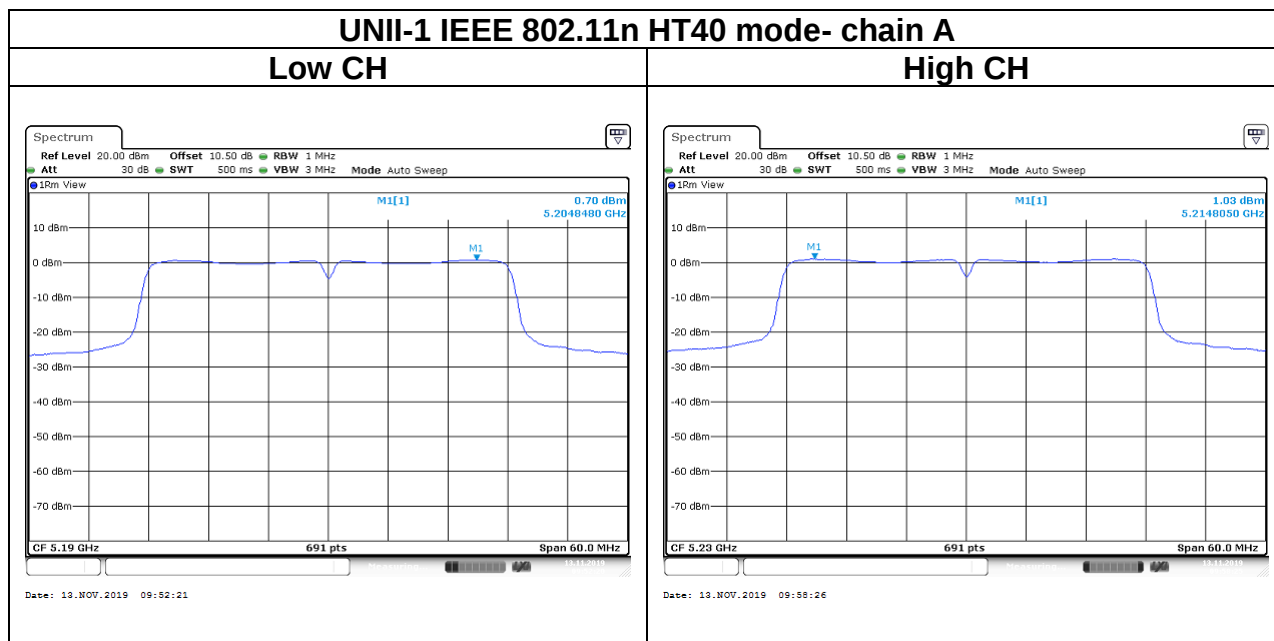




Report No.: T190902W03-RP4

Page: 89 / 251
Rev.: 02

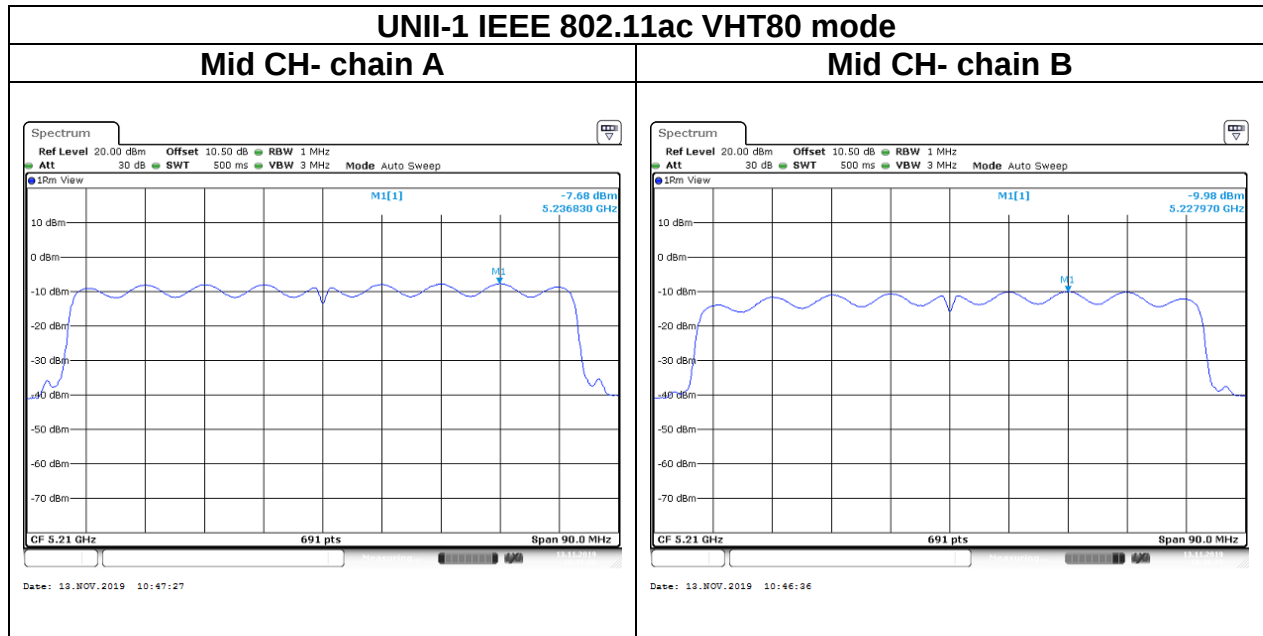




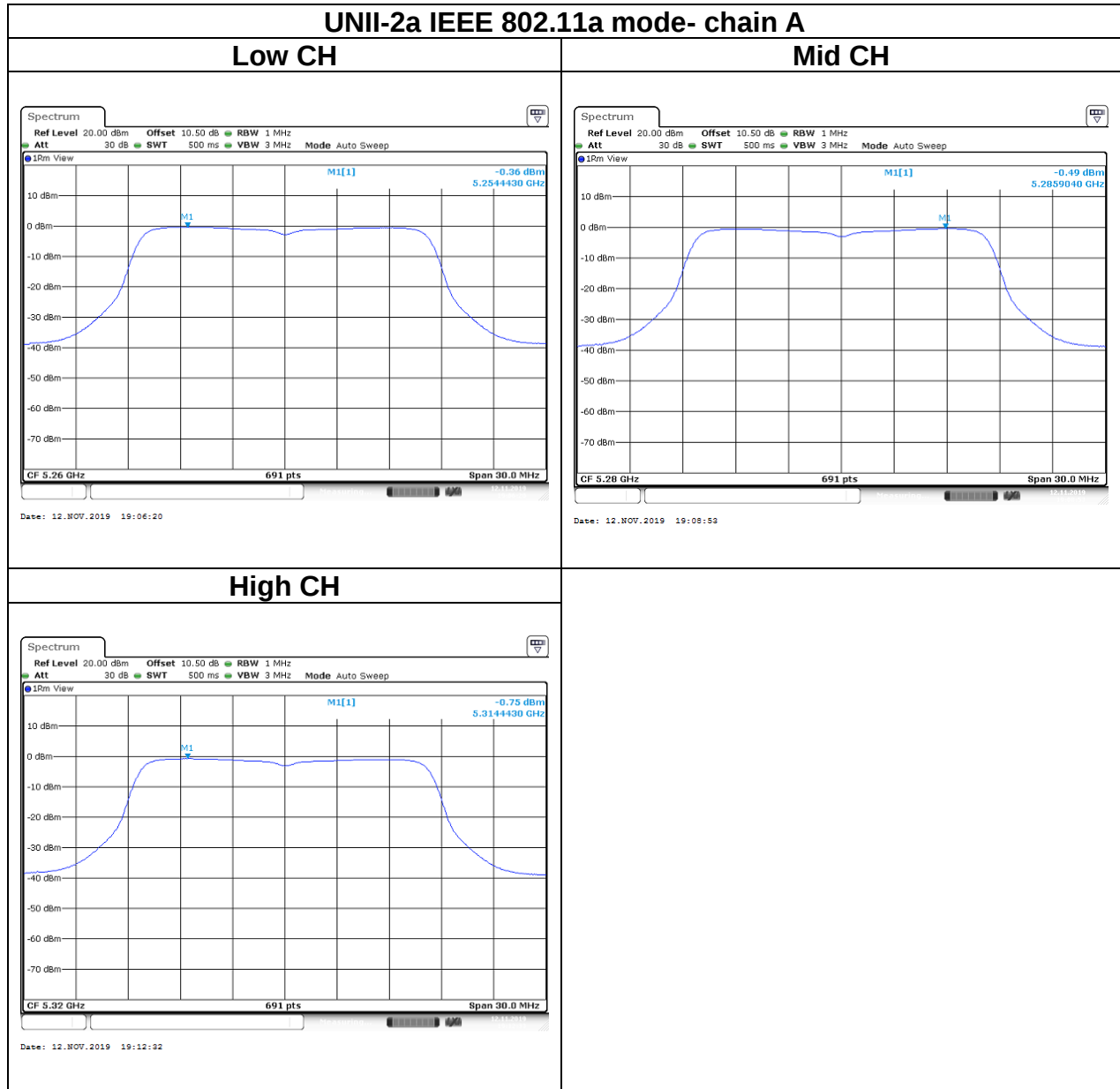


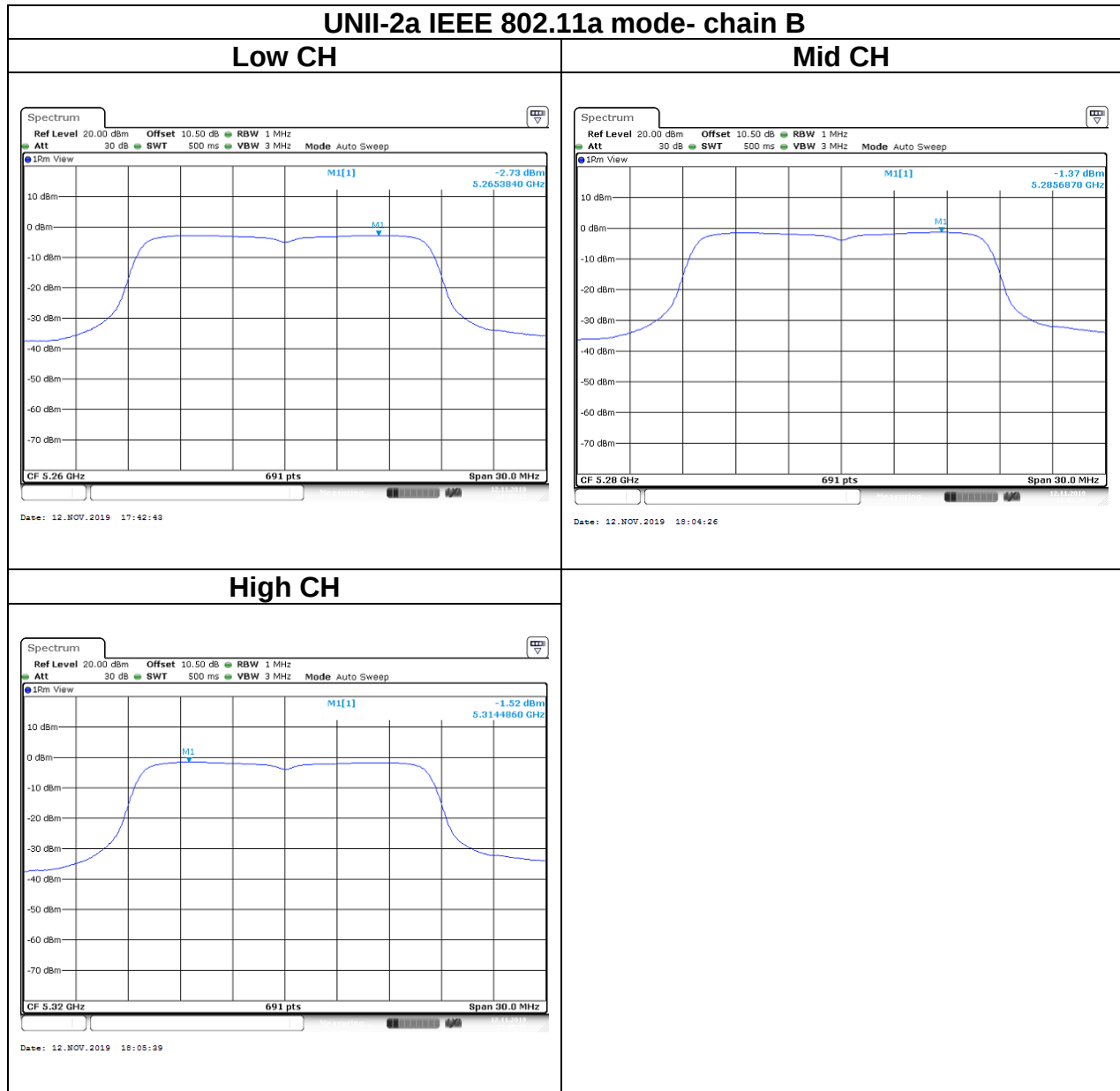
Report No.: T190902W03-RP4

Page: 91 / 251
Rev.: 02



Test Data

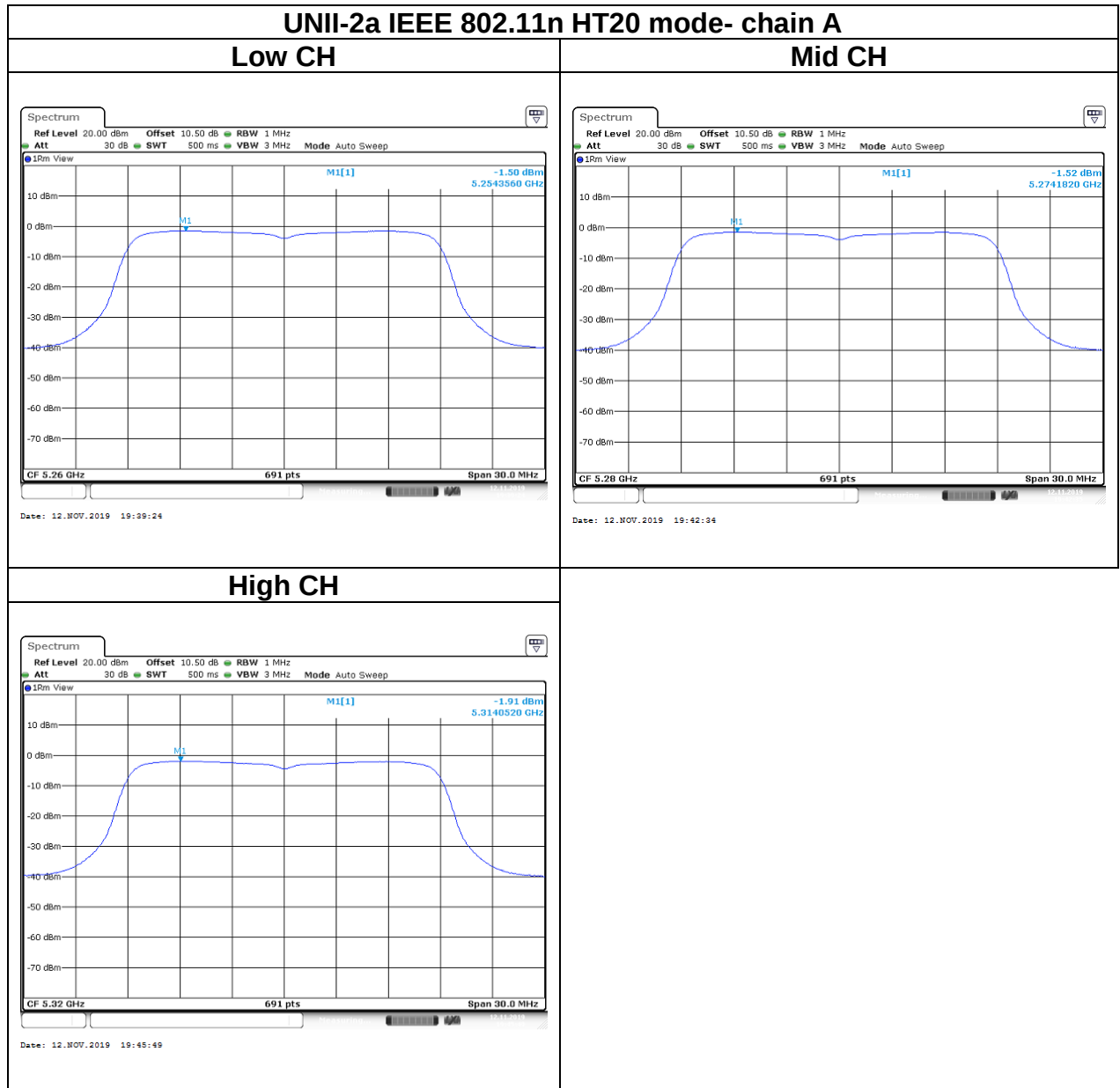






Report No.: T190902W03-RP4

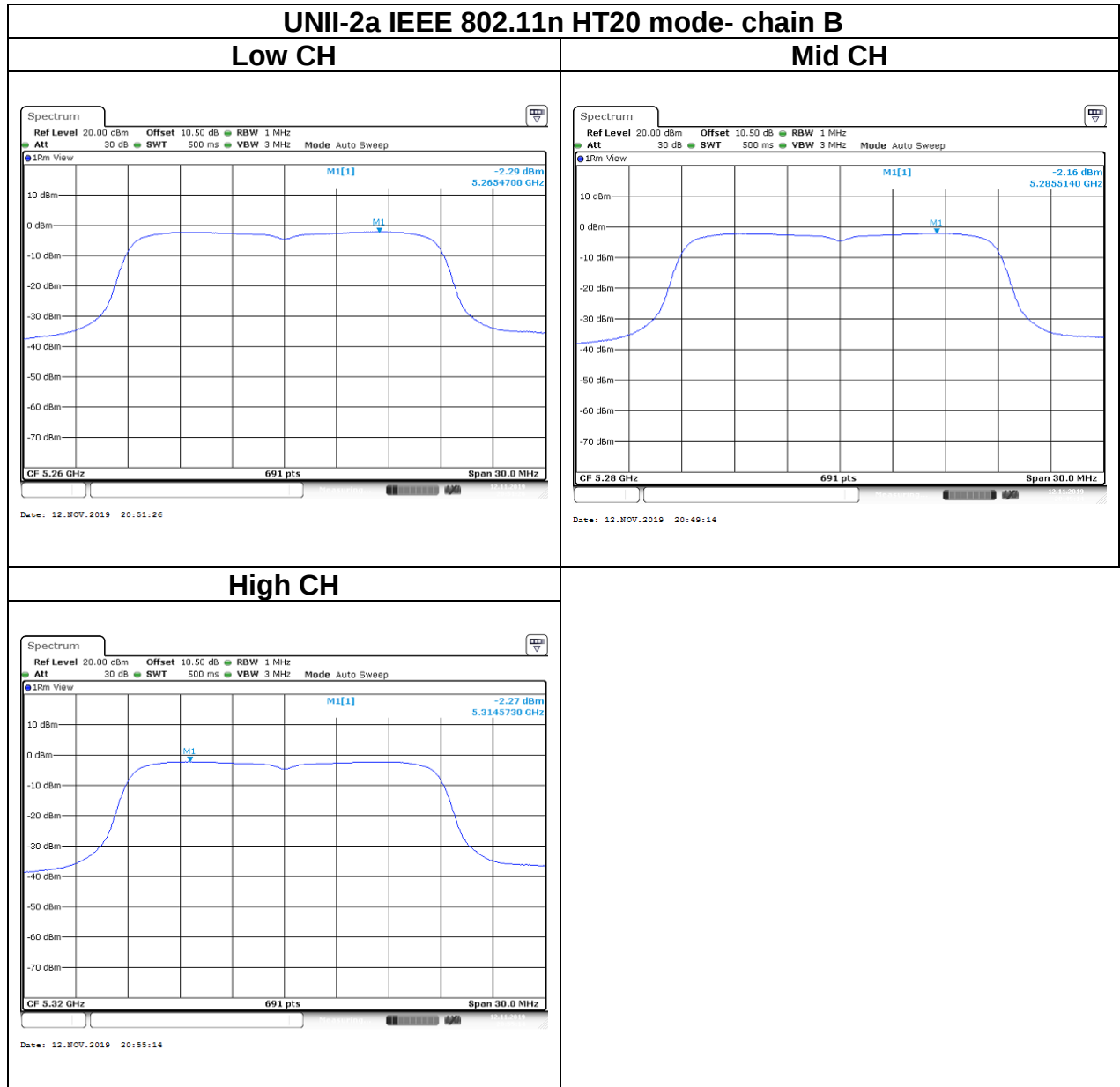
Page: 94 / 251
Rev.: 02





Report No.: T190902W03-RP4

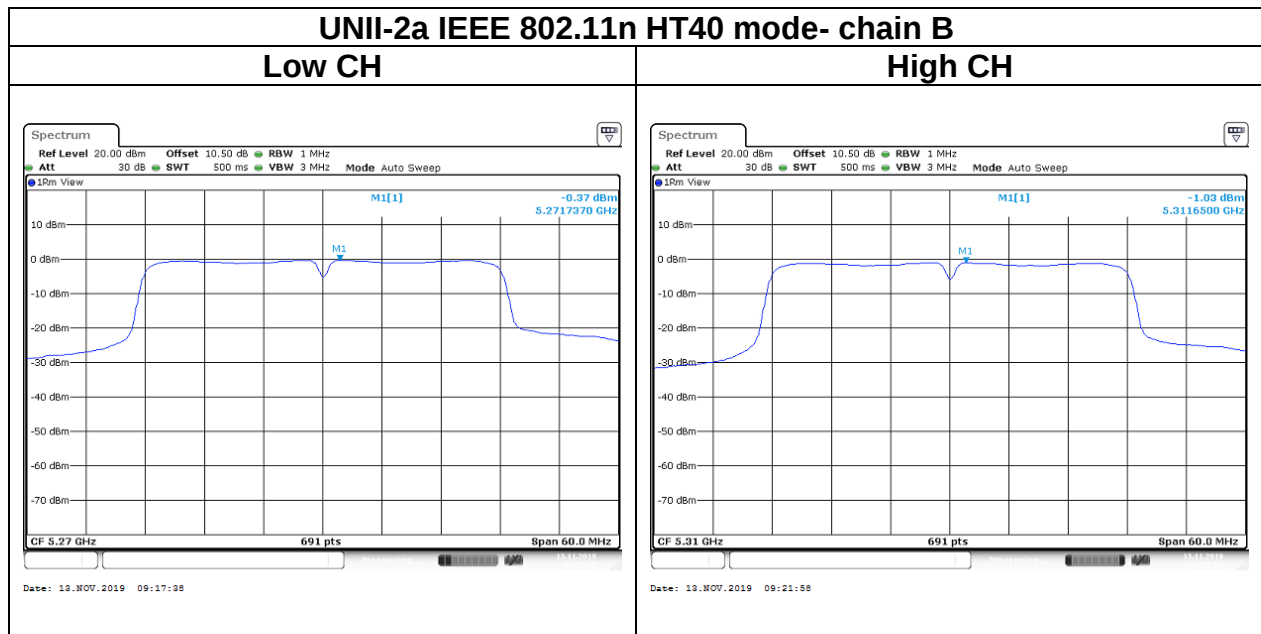
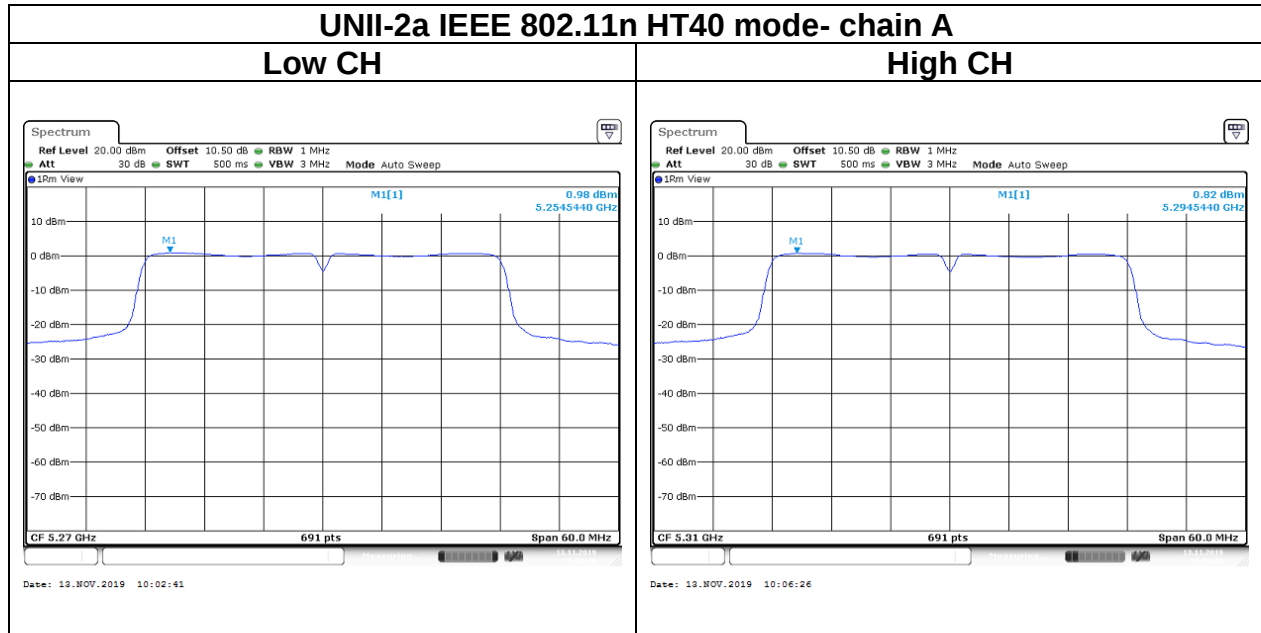
Page: 95 / 251
Rev.: 02





Report No.: T190902W03-RP4

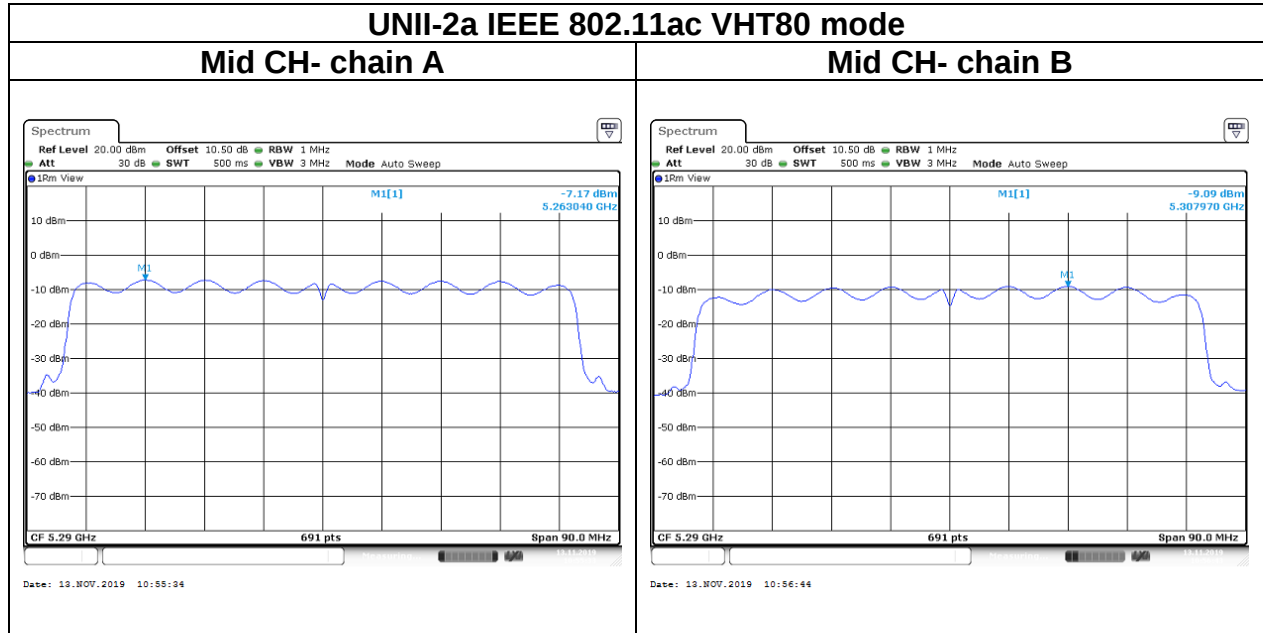
Page: 96 / 251
Rev.: 02





Report No.: T190902W03-RP4

Page: 97 / 251
Rev.: 02

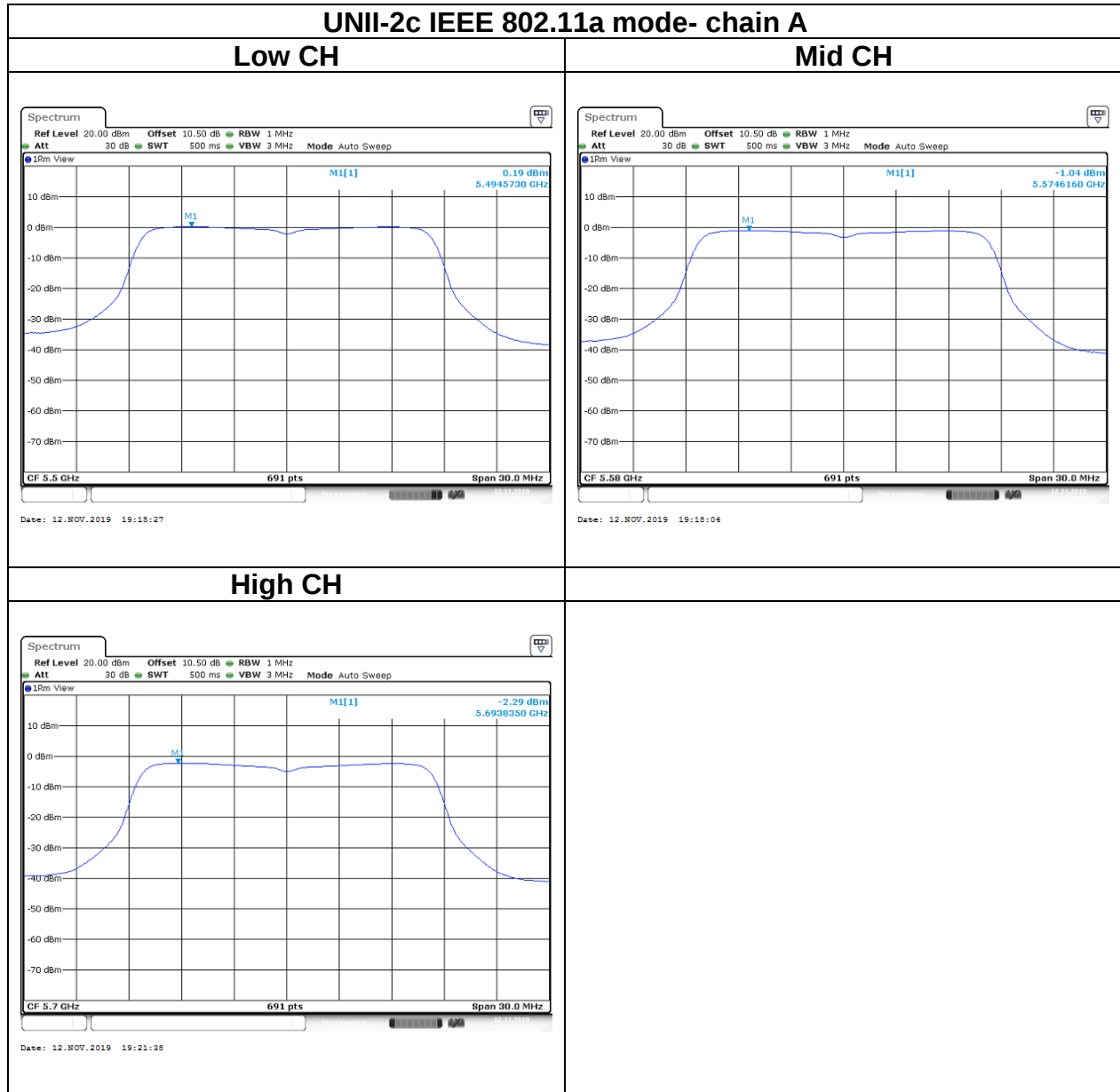




Report No.: T190902W03-RP4

Page: 98 / 251
Rev.: 02

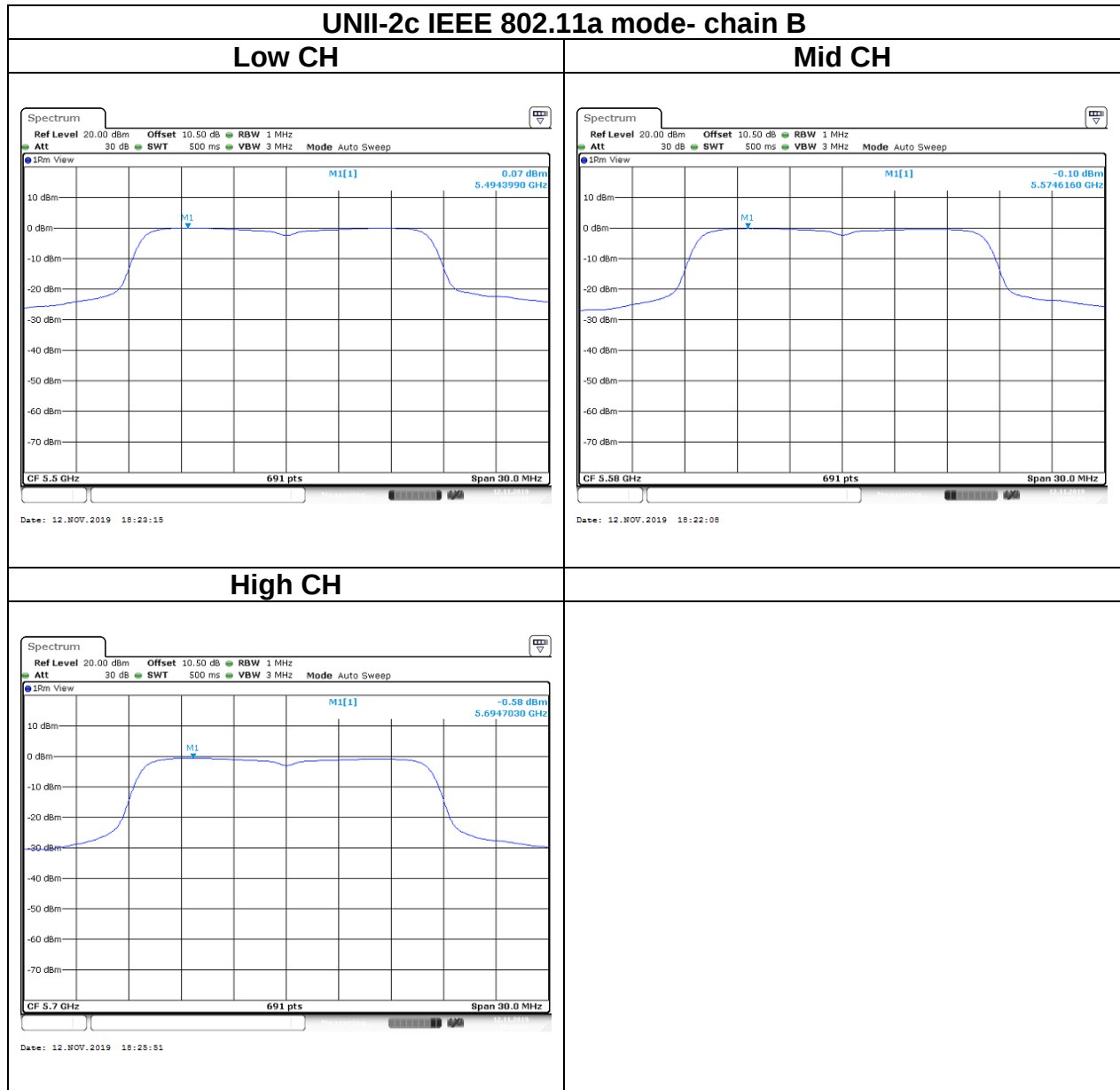
Test Data





Report No.: T190902W03-RP4

Page: 99 / 251
Rev.: 02





Report No.: T190902W03-RP4

Page: 100 / 251
Rev.: 02

