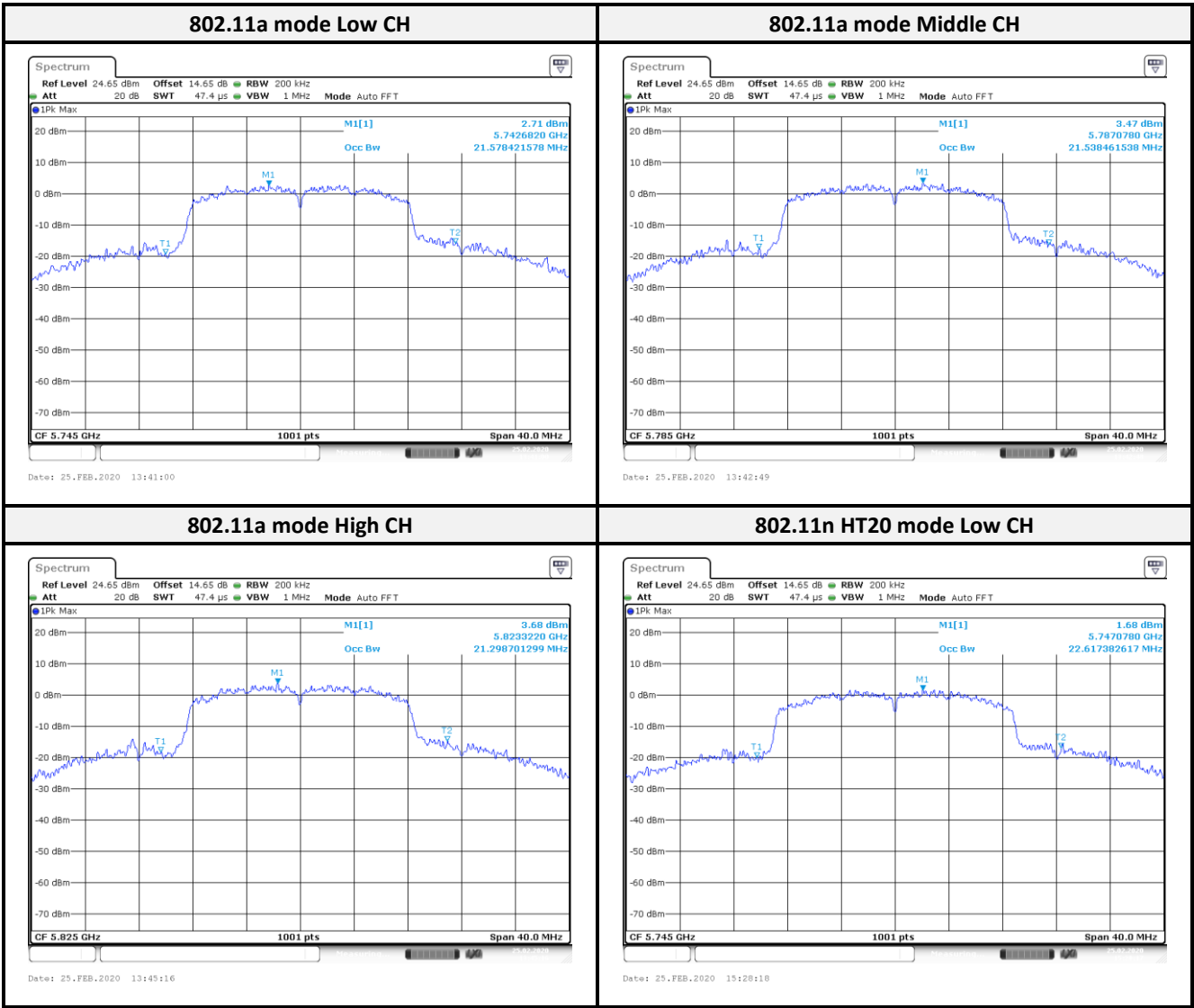
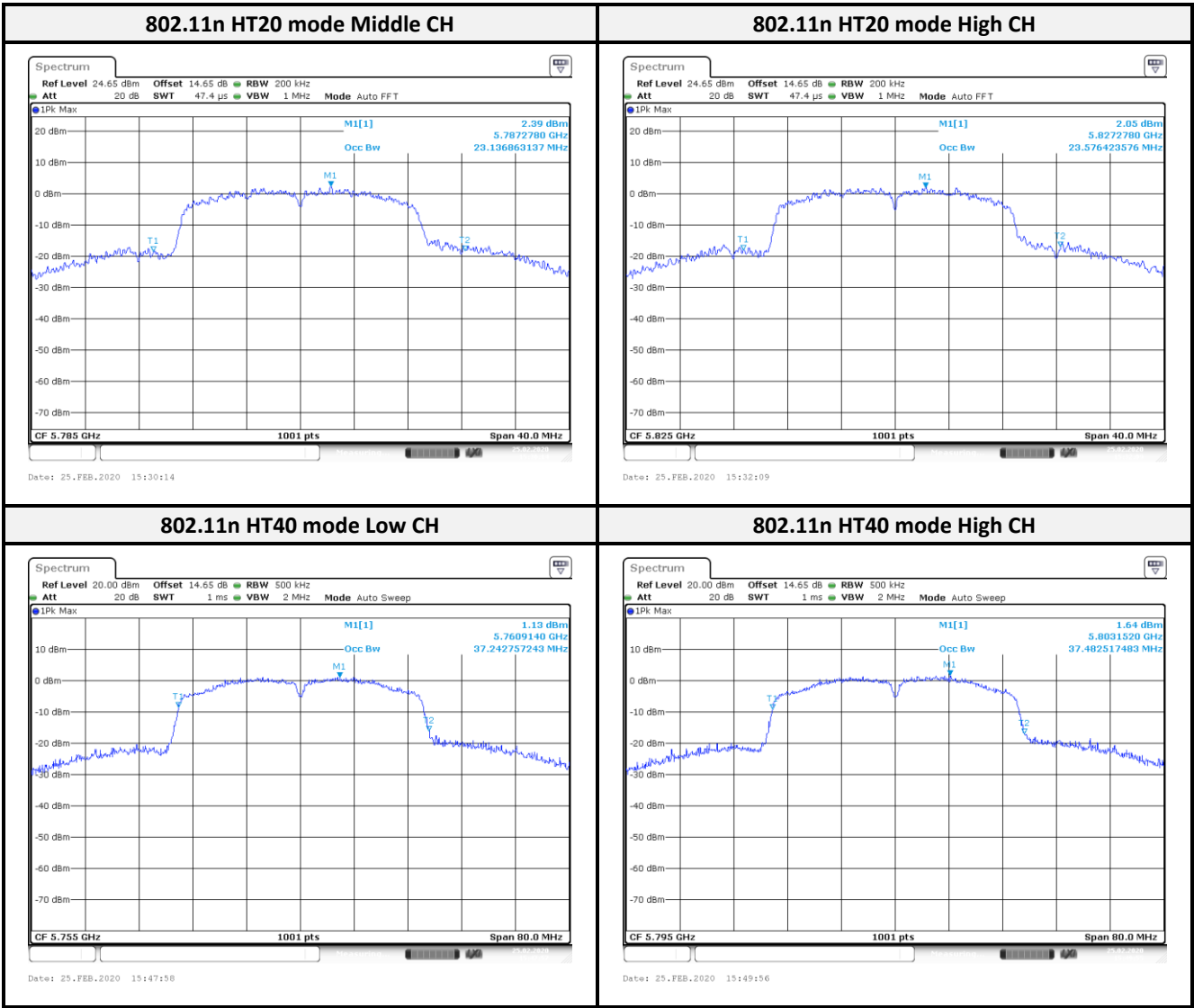


For UNII-3





10 FCC §15.407(a)(1) and RSS-247 Sec 6.2 – Maximum Output Power

10.1 Applicable Standard

According to FCC §15.407(a),

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.

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 $11 \text{ dBm} + 10 \log B$, 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. 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.

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.

- Frequency band 5150-5250 MHz

There is no requirement in RSS-247 for the value of bandwidth. However, the 99% bandwidth is used to calculate the power limits given in RSS-247 section 6.2.1.1. Power measurements are made using the 99% Bandwidth as the integration bandwidth.

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log 10B$, dBm, whichever is less stringent. Devices shall implement transmitter power control (TPC) in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW.

For other devices, the maximum e.i.r.p. shall not exceed 200 mW or $10 + 10 \log 10B$, dBm, whichever power is less. B is the 99% emission bandwidth in megahertz.

- Frequency band 5250-5350 MHz

For OEM devices installed in vehicles, the maximum e.i.r.p. shall not exceed 30 mW or $1.76 + 10 \log 10B$, dBm, whichever is less. Devices shall implement TPC in order to have the capability to operate at least 3 dB below the maximum permitted e.i.r.p. of 30 mW. Devices, other than devices installed in vehicles, shall comply with the following:

a) The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band;

b) The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W

- Frequency bands 5470-5600 MHz and 5650-5725 MHz

The maximum conducted output power shall not exceed 250 mW or $11 + 10 \log 10B$, dBm, whichever is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or $17 + 10 \log 10B$, dBm, whichever is less. B is the 99% emission bandwidth in megahertz. Note that devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

- Frequency band 5725-5850 MHz

For equipment operating in the band 5725-5850 MHz, the minimum 6 dB bandwidth shall be at least 500 kHz. The maximum conducted output power shall not exceed 1 W. The output 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 output 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 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.

10.2 Test Procedure

The use Power Meter

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a Power sensor.

10.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room(TH-02)					
USB Wideband Power Sensor	Agilent	U2021XA	MY56120026	2019/09/06	2020/09/05
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

10.4 Test Data

< Dipole antenna (TAOGLAS GW.71.5153)>

Band	Configure	CH	Freq. (MHz)	Conducted Output Power		FCC Limit (dBm)	Ant Gain (dBi)	EIRP Output Power		ISED EIRP Limit (dBm)
				(dBm)	(W)			(dBm)	(W)	
UNII-1	IEEE 802.11a	36	5180	8.31	0.0068	24.00	5.50	13.81	0.0240	22.43
		40	5200	7.58	0.0057	24.00	5.50	13.08	0.0203	22.41
		48	5240	7.44	0.0055	24.00	5.50	12.94	0.0197	22.44
	IEEE 802.11n HT20	36	5180	7.87	0.0061	24.00	5.50	13.37	0.0217	22.66
		40	5200	7.79	0.0060	24.00	5.50	13.29	0.0213	22.67
		48	5240	7.71	0.0059	24.00	5.50	13.21	0.0209	22.62
	IEEE 802.11n HT40	38	5190	7.46	0.0056	24.00	5.50	12.96	0.0198	23.00
		46	5230	9.59	0.0091	24.00	5.50	15.09	0.0323	23.00
UNII-2a	IEEE 802.11a	52	5260	12.31	0.0170	23.39	5.50	17.81	0.0604	29.39
		60	5300	11.93	0.0156	23.32	5.50	17.43	0.0553	29.32
		64	5320	11.81	0.0152	23.37	5.50	17.31	0.0538	29.37
	IEEE 802.11n HT20	52	5260	12.55	0.0180	23.64	5.50	18.05	0.0638	29.64
		60	5300	12.12	0.0163	23.59	5.50	17.62	0.0578	29.59
		64	5320	11.91	0.0155	23.58	5.50	17.41	0.0551	29.58
	IEEE 802.11n HT40	54	5270	9.53	0.0090	24.00	5.50	15.03	0.0318	30.00
		62	5310	8.58	0.0072	24.00	5.50	14.08	0.0256	30.00
UNII-2c	IEEE 802.11a	100	5500	13.08	0.0203	23.76	5.50	18.58	0.0721	29.76
		116	5580	13.18	0.0208	23.98	5.50	18.68	0.0738	29.98
		140	5700	10.02	0.0100	23.37	5.50	15.52	0.0356	29.37
	IEEE 802.11n HT20	100	5500	13.14	0.0206	24.00	5.50	18.64	0.0731	30.00
		116	5580	13.03	0.0201	24.00	5.50	18.53	0.0713	30.00
		140	5700	9.25	0.0084	23.57	5.50	14.75	0.0299	29.57
	IEEE 802.11n HT40	102	5510	10.71	0.0118	24.00	5.50	16.21	0.0418	30.00
		110	5550	10.75	0.0119	24.00	5.50	16.25	0.0422	30.00
		134	5670	11.59	0.0144	24.00	5.50	17.09	0.0512	30.00
UNII-3	IEEE 802.11a	149	5745	13.71	0.0235	30.00	5.50	19.21	0.0834	36.00
		157	5785	13.65	0.0232	30.00	5.50	19.15	0.0822	36.00
		165	5825	13.98	0.0250	30.00	5.50	19.48	0.0887	36.00
	IEEE 802.11n HT20	149	5745	13.75	0.0237	30.00	5.50	19.25	0.0841	36.00
		157	5785	14.02	0.0252	30.00	5.50	19.52	0.0895	36.00
		165	5825	14.18	0.0262	30.00	5.50	19.68	0.0929	36.00
	IEEE 802.11n HT40	151	5755	11.55	0.0143	30.00	5.50	17.05	0.0507	36.00
		159	5795	11.82	0.0152	30.00	5.50	17.32	0.0540	36.00

Note1: The Limit is Conducted Power for FCC. Note2: The Limit is Conducted + Antenna Gain = EIRP Power for ISEDC

Note3: The power limit should calculate for 99% bandwidth less than 20MHz for ISEDC.

< Dipole antenna (Inside WLAN PRO-IS-299)>

Band	Configure	CH	Freq. (MHz)	Conducted Output Power		FCC Limit (dBm)	Ant Gain (dBi)	EIRP Output Power		ISED EIRP Limit (dBm)
				(dBm)	(W)			(dBm)	(W)	
UNII-1	IEEE 802.11a	36	5180	8.31	0.0068	24.00	1.60	14.05	0.0254	22.43
		40	5200	7.58	0.0057	24.00	1.60	14.13	0.0259	22.41
		48	5240	7.44	0.0055	24.00	1.60	14.38	0.0274	22.44
	IEEE 802.11n HT20	36	5180	7.87	0.0061	24.00	1.60	14.37	0.0274	22.66
		40	5200	7.79	0.0060	24.00	1.60	14.68	0.0294	22.67
		48	5240	7.71	0.0059	24.00	1.60	15.21	0.0332	22.62
	IEEE 802.11n HT40	38	5190	7.46	0.0056	24.00	1.60	11.78	0.0151	23.00
		46	5230	9.59	0.0091	24.00	1.60	11.19	0.0132	23.00
UNII-2a	IEEE 802.11a	52	5260	12.31	0.0170	23.39	1.60	13.91	0.0246	29.39
		60	5300	11.93	0.0156	23.32	1.60	13.53	0.0225	29.32
		64	5320	11.81	0.0152	23.37	1.60	13.41	0.0219	29.37
	IEEE 802.11n HT20	52	5260	12.55	0.0180	23.64	1.60	14.15	0.0260	29.64
		60	5300	12.12	0.0163	23.59	1.60	13.72	0.0236	29.59
		64	5320	11.91	0.0155	23.58	1.60	13.51	0.0224	29.58
	IEEE 802.11n HT40	54	5270	9.53	0.0090	24.00	1.60	11.13	0.0130	30.00
		62	5310	8.58	0.0072	24.00	1.60	9.73	0.0094	30.00
UNII-2c	IEEE 802.11a	100	5500	13.08	0.0203	23.76	1.60	14.68	0.0294	29.76
		116	5580	13.18	0.0208	23.98	1.60	14.78	0.0301	29.98
		140	5700	10.02	0.0100	23.37	1.60	14.96	0.0313	29.37
	IEEE 802.11n HT20	100	5500	13.14	0.0206	24.00	1.60	14.74	0.0298	30.00
		116	5580	13.03	0.0201	24.00	1.60	14.63	0.0290	30.00
		140	5700	9.25	0.0084	23.57	1.60	13.73	0.0236	29.57
	IEEE 802.11n HT40	102	5510	10.71	0.0118	24.00	1.60	12.77	0.0189	30.00
		110	5550	10.75	0.0119	24.00	1.60	12.35	0.0172	30.00
		134	5670	11.59	0.0144	24.00	1.60	13.58	0.0228	30.00
UNII-3	IEEE 802.11a	149	5745	13.71	0.0235	30.00	1.60	15.31	0.0340	36.00
		157	5785	13.65	0.0232	30.00	1.60	15.25	0.0335	36.00
		165	5825	13.98	0.0250	30.00	1.60	15.58	0.0361	36.00
	IEEE 802.11n HT20	149	5745	13.75	0.0237	30.00	1.60	15.35	0.0343	36.00
		157	5785	14.02	0.0252	30.00	1.60	15.62	0.0365	36.00
		165	5825	14.18	0.0262	30.00	1.60	15.78	0.0378	36.00
	IEEE 802.11n HT40	151	5755	11.55	0.0143	30.00	1.60	13.15	0.0207	36.00
		159	5795	11.82	0.0152	30.00	1.60	13.42	0.0220	36.00

Note1: The Limit is Conducted Power for FCC. Note2: The Limit is Conducted + Antenna Gain = EIRP Power for ISED

Note3: The power limit should calculate for 99% bandwidth less than 20MHz for ISED.

< PCB Antenna (Redpine Signals RSIA7)>

Band	Configure	CH	Freq. (MHz)	Conducted Output Power		FCC Limit (dBm)	Ant Gain (dBi)	EIRP Output Power		ISED EIRP Limit (dBm)
				(dBm)	(W)			(dBm)	(W)	
UNII-1	IEEE 802.11a	36	5180	8.31	0.0068	24.00	1.25	13.70	0.0234	22.43
		40	5200	7.58	0.0057	24.00	1.25	13.78	0.0239	22.41
		48	5240	7.44	0.0055	24.00	1.25	14.03	0.0253	22.44
	IEEE 802.11n HT20	36	5180	7.87	0.0061	24.00	1.25	14.02	0.0252	22.66
		40	5200	7.79	0.0060	24.00	1.25	14.33	0.0271	22.67
		48	5240	7.71	0.0059	24.00	1.25	14.86	0.0306	22.62
	IEEE 802.11n HT40	38	5190	7.46	0.0056	24.00	1.25	11.43	0.0139	23.00
		46	5230	9.59	0.0091	24.00	1.25	10.84	0.0121	23.00
UNII-2a	IEEE 802.11a	52	5260	12.31	0.0170	23.39	1.25	13.56	0.0227	29.39
		60	5300	11.93	0.0156	23.32	1.25	13.18	0.0208	29.32
		64	5320	11.81	0.0152	23.37	1.25	13.06	0.0202	29.37
	IEEE 802.11n HT20	52	5260	12.55	0.0180	23.64	1.25	13.80	0.0240	29.64
		60	5300	12.12	0.0163	23.59	1.25	13.37	0.0217	29.59
		64	5320	11.91	0.0155	23.58	1.25	13.16	0.0207	29.58
	IEEE 802.11n HT40	54	5270	9.53	0.0090	24.00	1.25	10.78	0.0120	30.00
		62	5310	8.58	0.0072	24.00	1.25	9.38	0.0087	30.00
UNII-2c	IEEE 802.11a	100	5500	13.08	0.0203	23.76	1.25	14.33	0.0271	29.76
		116	5580	13.18	0.0208	23.98	1.25	14.43	0.0277	29.98
		140	5700	10.02	0.0100	23.37	1.25	11.21	0.0132	29.37
	IEEE 802.11n HT20	100	5500	13.14	0.0206	24.00	1.25	14.39	0.0275	30.00
		116	5580	13.03	0.0201	24.00	1.25	14.28	0.0268	30.00
		140	5700	9.25	0.0084	23.57	1.25	10.46	0.0111	29.57
	IEEE 802.11n HT40	102	5510	10.71	0.0118	24.00	1.25	11.90	0.0155	30.00
		110	5550	10.75	0.0119	24.00	1.25	12.00	0.0158	30.00
		134	5670	11.59	0.0144	24.00	1.25	12.73	0.0187	30.00
UNII-3	IEEE 802.11a	149	5745	13.71	0.0235	30.00	1.25	14.96	0.0313	36.00
		157	5785	13.65	0.0232	30.00	1.25	14.90	0.0309	36.00
		165	5825	13.98	0.0250	30.00	1.25	15.23	0.0333	36.00
	IEEE 802.11n HT20	149	5745	13.75	0.0237	30.00	1.25	15.00	0.0316	36.00
		157	5785	14.02	0.0252	30.00	1.25	15.27	0.0337	36.00
		165	5825	14.18	0.0262	30.00	1.25	15.43	0.0349	36.00
	IEEE 802.11n HT40	151	5755	11.55	0.0143	30.00	1.25	12.80	0.0191	36.00
		159	5795	11.82	0.0152	30.00	1.25	13.07	0.0203	36.00

Note1: The Limit is Conducted Power for FCC. Note2: The Limit is Conducted + Antenna Gain = EIRP Power for ISED

Note3: The power limit should calculate for 99% bandwidth less than 20MHz for ISED.

< PIFA Antenna (SMARTEQ 4211613980)>

Band	Configure	CH	Freq. (MHz)	Conducted Output Power		FCC Limit (dBm)	Ant Gain (dBi)	EIRP Output Power		ISED EIRP Limit (dBm)
				(dBm)	(W)			(dBm)	(W)	
UNII-1	IEEE 802.11a	36	5180	8.31	0.0068	24.00	2.00	14.45	0.0279	22.43
		40	5200	7.58	0.0057	24.00	2.00	14.53	0.0284	22.41
		48	5240	7.44	0.0055	24.00	2.00	14.78	0.0301	22.44
	IEEE 802.11n HT20	36	5180	7.87	0.0061	24.00	2.00	14.77	0.0300	22.66
		40	5200	7.79	0.0060	24.00	2.00	15.08	0.0322	22.67
		48	5240	7.71	0.0059	24.00	2.00	15.61	0.0364	22.62
	IEEE 802.11n HT40	38	5190	7.46	0.0056	24.00	2.00	11.72	0.0149	23.00
		46	5230	9.59	0.0091	24.00	2.00	11.59	0.0144	23.00
UNII-2a	IEEE 802.11a	52	5260	12.31	0.0170	23.39	2.00	14.31	0.0270	29.39
		60	5300	11.93	0.0156	23.32	2.00	13.93	0.0247	29.32
		64	5320	11.81	0.0152	23.37	2.00	13.81	0.0240	29.37
	IEEE 802.11n HT20	52	5260	12.55	0.0180	23.64	2.00	14.55	0.0285	29.64
		60	5300	12.12	0.0163	23.59	2.00	14.12	0.0258	29.59
		64	5320	11.91	0.0155	23.58	2.00	13.91	0.0246	29.58
	IEEE 802.11n HT40	54	5270	9.53	0.0090	24.00	2.00	11.53	0.0142	30.00
		62	5310	8.58	0.0072	24.00	2.00	10.86	0.0122	30.00
UNII-2c	IEEE 802.11a	100	5500	13.08	0.0203	23.76	2.00	15.29	0.0338	29.76
		116	5580	13.18	0.0208	23.98	2.00	15.18	0.0330	29.98
		140	5700	10.02	0.0100	23.37	2.00	14.62	0.0290	29.37
	IEEE 802.11n HT20	100	5500	13.14	0.0206	24.00	2.00	15.18	0.0330	30.00
		116	5580	13.03	0.0201	24.00	2.00	15.03	0.0318	30.00
		140	5700	9.25	0.0084	23.57	2.00	14.21	0.0264	29.57
	IEEE 802.11n HT40	102	5510	10.71	0.0118	24.00	2.00	11.68	0.0147	30.00
		110	5550	10.75	0.0119	24.00	2.00	13.13	0.0206	30.00
		134	5670	11.59	0.0144	24.00	2.00	14.56	0.0286	30.00
UNII-3	IEEE 802.11a	149	5745	13.71	0.0235	30.00	2.00	15.71	0.0372	36.00
		157	5785	13.65	0.0232	30.00	2.00	15.65	0.0367	36.00
		165	5825	13.98	0.0250	30.00	2.00	15.98	0.0396	36.00
	IEEE 802.11n HT20	149	5745	13.75	0.0237	30.00	2.00	15.75	0.0376	36.00
		157	5785	14.02	0.0252	30.00	2.00	16.02	0.0400	36.00
		165	5825	14.18	0.0262	30.00	2.00	16.18	0.0415	36.00
	IEEE 802.11n HT40	151	5755	11.55	0.0143	30.00	2.00	13.55	0.0226	36.00
		159	5795	11.82	0.0152	30.00	2.00	13.82	0.0241	36.00

Note1: The Limit is Conducted Power for FCC. Note2: The Limit is Conducted + Antenna Gain = EIRP Power for ISDEC

Note3: The power limit should calculate for 99% bandwidth less than 20MHz for ISDEC.

11 FCC §15.407(a) and RSS-247 Sec 6.2 – Power Spectral Density

11.1 Applicable Standard

According to FCC §15.407(a),

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.

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..

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.

According to RSS-247 Sec 6.2:

For 5150-5250 MHz: The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band

For 5250-5350 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band

For 5470-5725 MHz: The power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

For 5725-5850 MHz: The output power spectral density shall not exceed 30 dBm in any 500 kHz band

11.2 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01 and ANSI 63.10: 2013 Sec 10.3.7.

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 Section 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 the RBW to 1 MHz.
- b) Set the VBW to be at least 1 MHz (a VBW of 3 MHz is desirable).
- c) Set the frequency span to examine the spectrum across a convenient frequency segment (e.g., 600 MHz).
- d) Select the power averaging (rms) detector.
- e) Set the sweep time so that there is no more than a 1 ms integration period over each measurement bin.
- 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.

11.3 Test Equipment List and Details

Description	Manufacture	Model	Serial No.	Cal. Date.	Cal. Due.
Conducted Room					
Signal Analyzer 40GHZ	Rohde & Schwarz	FSV40-N	102248	2019/09/11	2020/09/10
RF Cable	MTJ	MT40S	MT40S-001	Each Use	/

***Statement of Traceability:** The testing equipment's listed above have finished the calibration by Electronics Testing Center, Taiwan (ETC) or other laboratories which were accredited by TAF or equivalent organizations. The calibration result could be traceable to the International System of Units (SI).

11.4 Test Data and Test Plot

< Dipole antenna (TAOGLAS GW.71.5153)>

Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/MHz)	FCC Limit (dBm/MHz)	ISED EIRP Limit (dBm/MHz)
UNII-1	IEEE 802.11a	36	5180	4.45	5.50	9.95	11	10
		40	5200	3.94	5.50	9.44	11	10
		48	5240	3.77	5.50	9.27	11	10
	IEEE 802.11n HT20	36	5180	3.44	5.50	8.94	11	10
		40	5200	3.44	5.50	8.94	11	10
		48	5240	3.49	5.50	8.99	11	10
	IEEE 802.11n HT40	38	5190	-0.69	5.50	4.81	11	10
		46	5230	1.44	5.50	6.94	11	10
UNII-2a	IEEE 802.11a	52	5260	7.21	5.50	12.71	11	17
		60	5300	7.11	5.50	12.61	11	17
		64	5320	6.65	5.50	12.15	11	17
	IEEE 802.11n HT20	52	5260	6.94	5.50	12.44	11	17
		60	5300	7.19	5.50	12.69	11	17
		64	5320	7.04	5.50	12.54	11	17
	IEEE 802.11n HT40	54	5270	2.17	5.50	7.67	11	17
		62	5310	0.39	5.50	5.89	11	17
UNII-2c	IEEE 802.11a	100	5500	7.87	5.50	13.37	11	17
		116	5580	8.26	5.50	13.76	11	17
		140	5700	4.88	5.50	10.38	11	17
	IEEE 802.11n HT20	100	5500	7.88	5.50	13.38	11	17
		116	5580	7.71	5.50	13.21	11	17
		140	5700	3.87	5.50	9.37	11	17
	IEEE 802.11n HT40	102	5510	2.47	5.50	7.97	11	17
		110	5550	2.92	5.50	8.42	11	17
		134	5670	2.37	5.50	7.87	11	17
Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/500kHz)	FCC Limit (dBm/500kHz)	ISED Limit (dBm/500kHz)
UNII-3	IEEE 802.11a	149	5745	7.30	5.50	-	30.00	30.00
		157	5785	7.44	5.50	-	30.00	30.00
		165	5825	7.06	5.50	-	30.00	30.00
	IEEE 802.11n HT20	149	5745	5.45	5.50	-	30.00	30.00
		157	5785	5.82	5.50	-	30.00	30.00
		165	5825	5.93	5.50	-	30.00	30.00
	IEEE 802.11n HT40	151	5755	0.91	5.50	-	30.00	30.00
		159	5795	0.95	5.50	-	30.00	30.00

Note: Duty Factor = 0 dB.

< Dipole antenna (Inside WLAN PRO-IS-299)>

Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/MHz)	FCC Limit (dBm/MHz)	ISED EIRP Limit (dBm/MHz)
UNII-1	IEEE 802.11a	36	5180	7.87	1.60	9.47	11	10
		40	5200	6.98	1.60	8.58	11	10
		48	5240	7.40	1.60	9.00	11	10
	IEEE 802.11n HT20	36	5180	6.86	1.60	8.46	11	10
		40	5200	7.09	1.60	8.69	11	10
		48	5240	7.48	1.60	9.08	11	10
	IEEE 802.11n HT40	38	5190	1.60	1.60	3.20	11	10
		46	5230	1.44	1.60	3.04	11	10
UNII-2a	IEEE 802.11a	52	5260	7.21	1.60	8.81	11	17
		60	5300	7.11	1.60	8.71	11	17
		64	5320	6.65	1.60	8.25	11	17
	IEEE 802.11n HT20	52	5260	6.94	1.60	8.54	11	17
		60	5300	7.19	1.60	8.79	11	17
		64	5320	7.04	1.60	8.64	11	17
	IEEE 802.11n HT40	54	5270	2.17	1.60	3.77	11	17
		62	5310	0.21	1.60	1.81	11	17
UNII-2c	IEEE 802.11a	100	5500	7.87	1.60	9.47	11	17
		116	5580	8.26	1.60	9.86	11	17
		140	5700	7.97	1.60	9.57	11	17
	IEEE 802.11n HT20	100	5500	7.88	1.60	9.48	11	17
		116	5580	7.71	1.60	9.31	11	17
		140	5700	6.77	1.60	8.37	11	17
	IEEE 802.11n HT40	102	5510	3.18	1.60	4.78	11	17
		110	5550	2.92	1.60	4.52	11	17
UNII-3	IEEE 802.11a	149	5745	7.30	1.60	-	30.00	30.00
		157	5785	7.44	1.60	-	30.00	30.00
		165	5825	7.06	1.60	-	30.00	30.00
	IEEE 802.11n HT20	149	5745	5.45	1.60	-	30.00	30.00
		157	5785	5.82	1.60	-	30.00	30.00
		165	5825	5.93	1.60	-	30.00	30.00
	IEEE 802.11n HT40	151	5755	0.91	1.60	-	30.00	30.00
		159	5795	0.95	1.60	-	30.00	30.00

Note: Duty Factor = 0 dB.

< PCB Antenna (Redpine Signals RSIA7)>

Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/MHz)	FCC Limit (dBm/MHz)	ISED EIRP Limit (dBm/MHz)
UNII-1	IEEE 802.11a	36	5180	7.87	1.25	9.12	11	10
		40	5200	6.98	1.25	8.23	11	10
		48	5240	7.40	1.25	8.65	11	10
	IEEE 802.11n HT20	36	5180	6.86	1.25	8.11	11	10
		40	5200	7.09	1.25	8.34	11	10
		48	5240	7.48	1.25	8.73	11	10
	IEEE 802.11n HT40	38	5190	-0.69	1.25	0.56	11	10
		46	5230	1.44	1.25	2.69	11	10
UNII-2a	IEEE 802.11a	52	5260	7.21	1.25	8.46	11	17
		60	5300	7.11	1.25	8.36	11	17
		64	5320	6.65	1.25	7.90	11	17
	IEEE 802.11n HT20	52	5260	6.94	1.25	8.19	11	17
		60	5300	7.19	1.25	8.44	11	17
		64	5320	7.04	1.25	8.29	11	17
	IEEE 802.11n HT40	54	5270	2.17	1.25	3.42	11	17
		62	5310	0.39	1.25	1.64	11	17
UNII-2c	IEEE 802.11a	100	5500	7.87	1.25	9.12	11	17
		116	5580	8.26	1.25	9.51	11	17
		140	5700	4.88	1.25	6.13	11	17
	IEEE 802.11n HT20	100	5500	7.88	1.25	9.13	11	17
		116	5580	7.71	1.25	8.96	11	17
		140	5700	3.87	1.25	5.12	11	17
	IEEE 802.11n HT40	102	5510	2.47	1.25	3.72	11	17
		110	5550	2.92	1.25	4.17	11	17
UNII-3	IEEE 802.11a	149	5745	7.30	1.25	-	30.00	30.00
		157	5785	7.44	1.25	-	30.00	30.00
		165	5825	7.06	1.25	-	30.00	30.00
	IEEE 802.11n HT20	149	5745	5.45	1.25	-	30.00	30.00
		157	5785	5.82	1.25	-	30.00	30.00
		165	5825	5.93	1.25	-	30.00	30.00
	IEEE 802.11n HT40	151	5755	0.91	1.25	-	30.00	30.00
		159	5795	0.95	1.25	-	30.00	30.00

Note: Duty Factor = 0 dB.

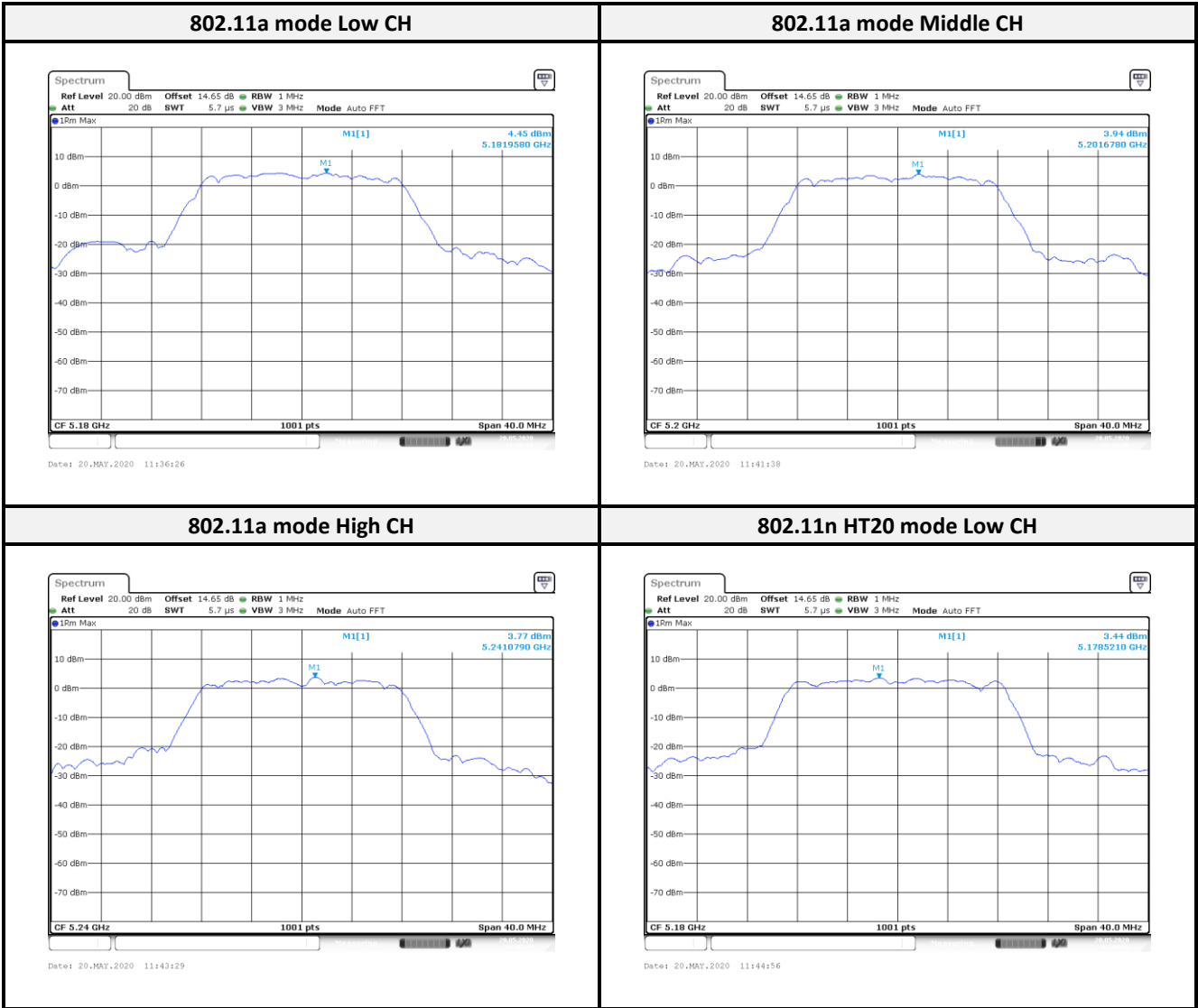
< PIFA Antenna (SMARTEQ 4211613980)>

Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/MHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/MHz)	FCC Limit (dBm/MHz)	ISED EIRP Limit (dBm/MHz)
UNII-1	IEEE 802.11a	36	5180	7.67	2.00	9.67	11	10
		40	5200	7.54	2.00	9.54	11	10
		48	5240	7.35	2.00	9.35	11	10
	IEEE 802.11n HT20	36	5180	7.91	2.00	9.91	11	10
		40	5200	7.56	2.00	9.56	11	10
		48	5240	7.24	2.00	9.24	11	10
	IEEE 802.11n HT40	38	5190	2.79	2.00	4.79	11	10
		46	5230	1.68	2.00	3.68	11	10
UNII-2a	IEEE 802.11a	52	5260	7.29	2.00	9.29	11	17
		60	5300	6.45	2.00	8.45	11	17
		64	5320	6.00	2.00	8.00	11	17
	IEEE 802.11n HT20	52	5260	6.98	2.00	8.98	11	17
		60	5300	6.48	2.00	8.48	11	17
		64	5320	5.91	2.00	7.91	11	17
	IEEE 802.11n HT40	54	5270	1.62	2.00	3.62	11	17
		62	5310	0.67	2.00	2.67	11	17
UNII-2c	IEEE 802.11a	100	5500	8.80	2.00	10.80	11	17
		116	5580	9.67	2.00	11.67	11	17
		140	5700	7.74	2.00	9.74	11	17
	IEEE 802.11n HT20	100	5500	8.33	2.00	10.33	11	17
		116	5580	9.34	2.00	11.34	11	17
		140	5700	7.80	2.00	9.80	11	17
	IEEE 802.11n HT40	102	5510	1.40	2.00	3.40	11	17
		110	5550	3.76	2.00	5.76	11	17
		134	5670	4.52	2.00	6.52	11	17
Band	Configuration	Channel	Frequency (MHz)	Power Spectral Density (dBm/500kHz)	Antenna Gain (dBi)	EIRP Power Spectral Density (dBm/500kHz)	FCC Limit (dBm/500kHz)	ISED Limit (dBm/500kHz)
UNII-3	IEEE 802.11a	149	5745	7.30	2.00	-	30.00	30.00
		157	5785	7.44	2.00	-	30.00	30.00
		165	5825	7.06	2.00	-	30.00	30.00
	IEEE 802.11n HT20	149	5745	5.45	2.00	-	30.00	30.00
		157	5785	5.82	2.00	-	30.00	30.00
		165	5825	5.93	2.00	-	30.00	30.00
	IEEE 802.11n HT40	151	5755	0.91	2.00	-	30.00	30.00
		159	5795	0.95	2.00	-	30.00	30.00

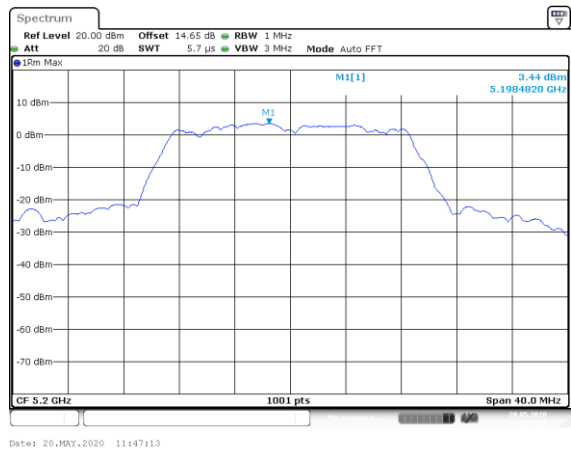
Note: Duty Factor = 0 dB.

< Dipole antenna (TAOGLAS GW.71.5153)>

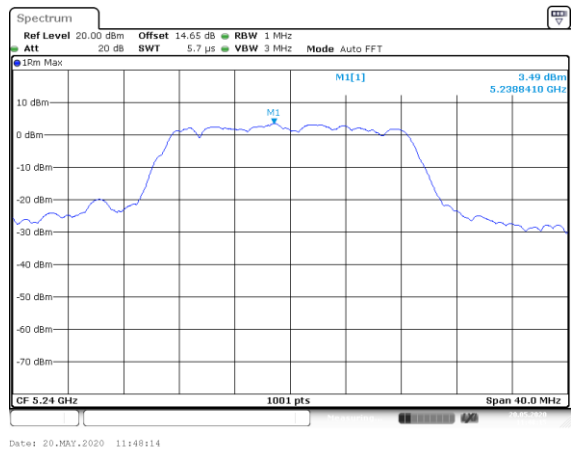
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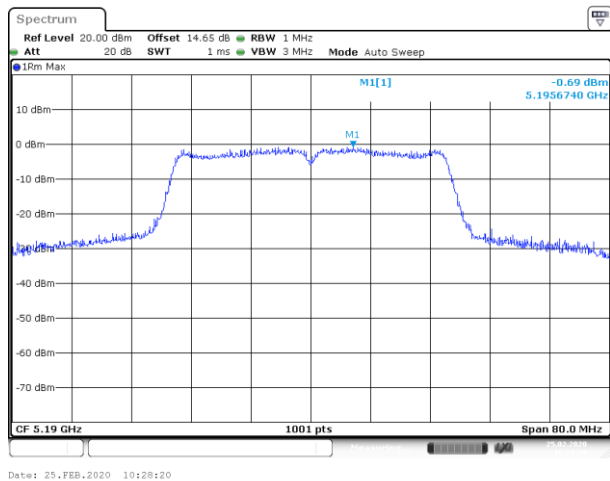
802.11n HT20 mode Middle CH



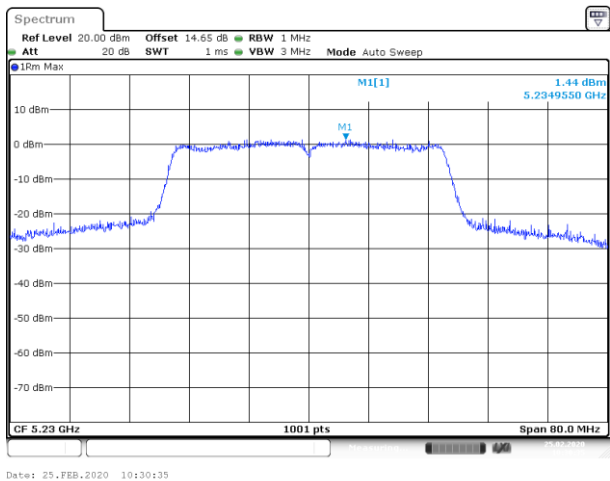
802.11n HT20 mode High CH



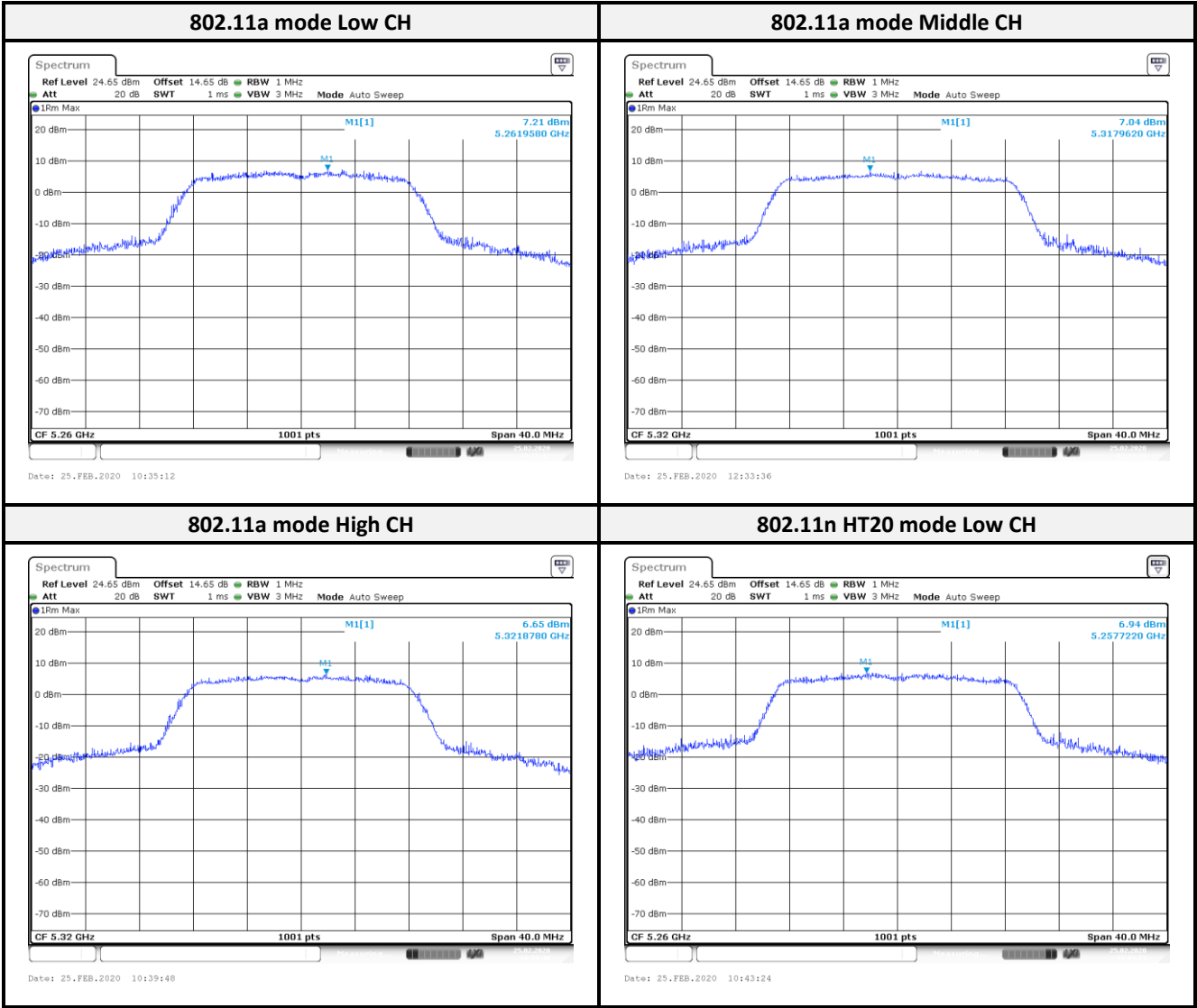
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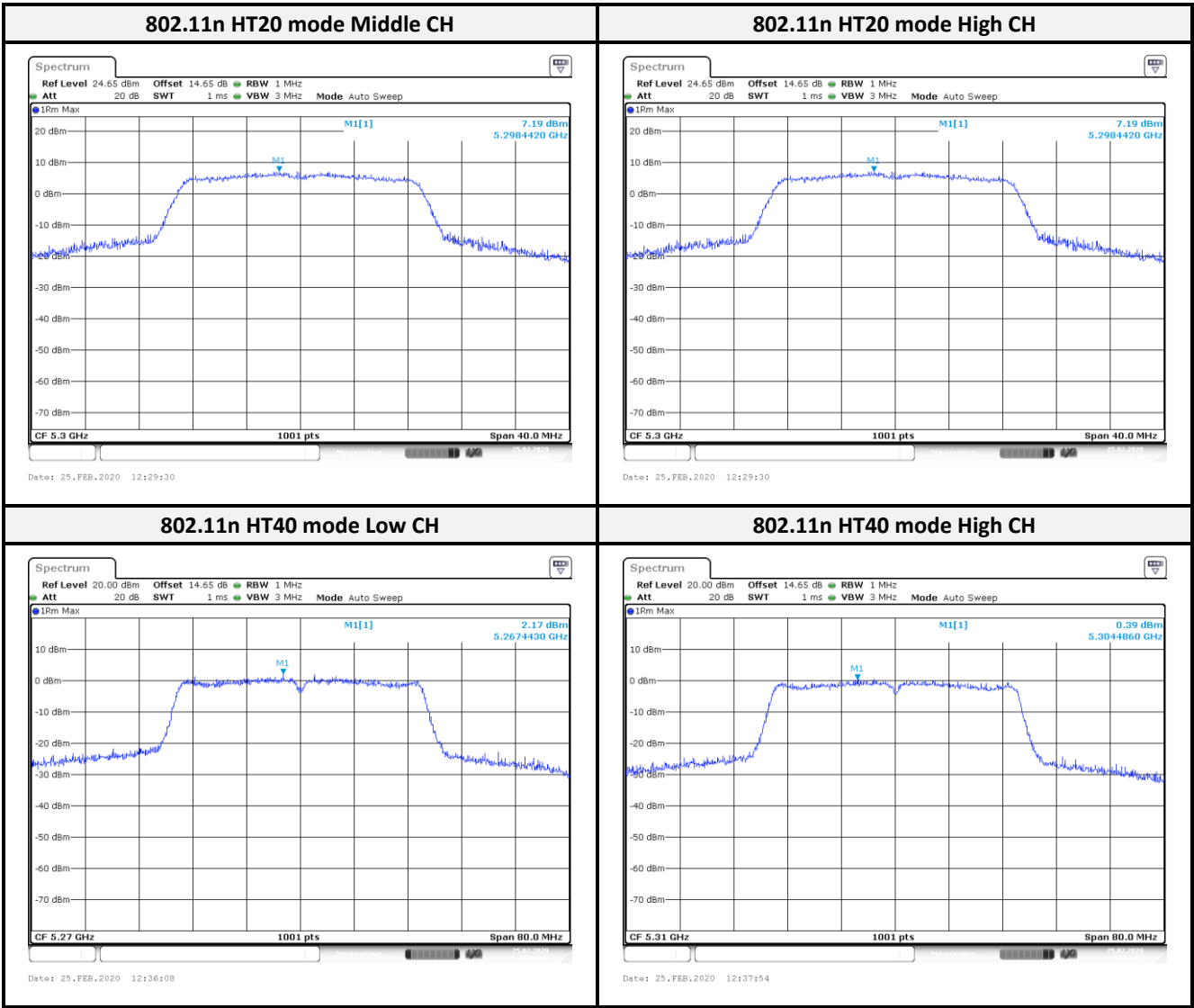


802.11n HT40 mode High CH

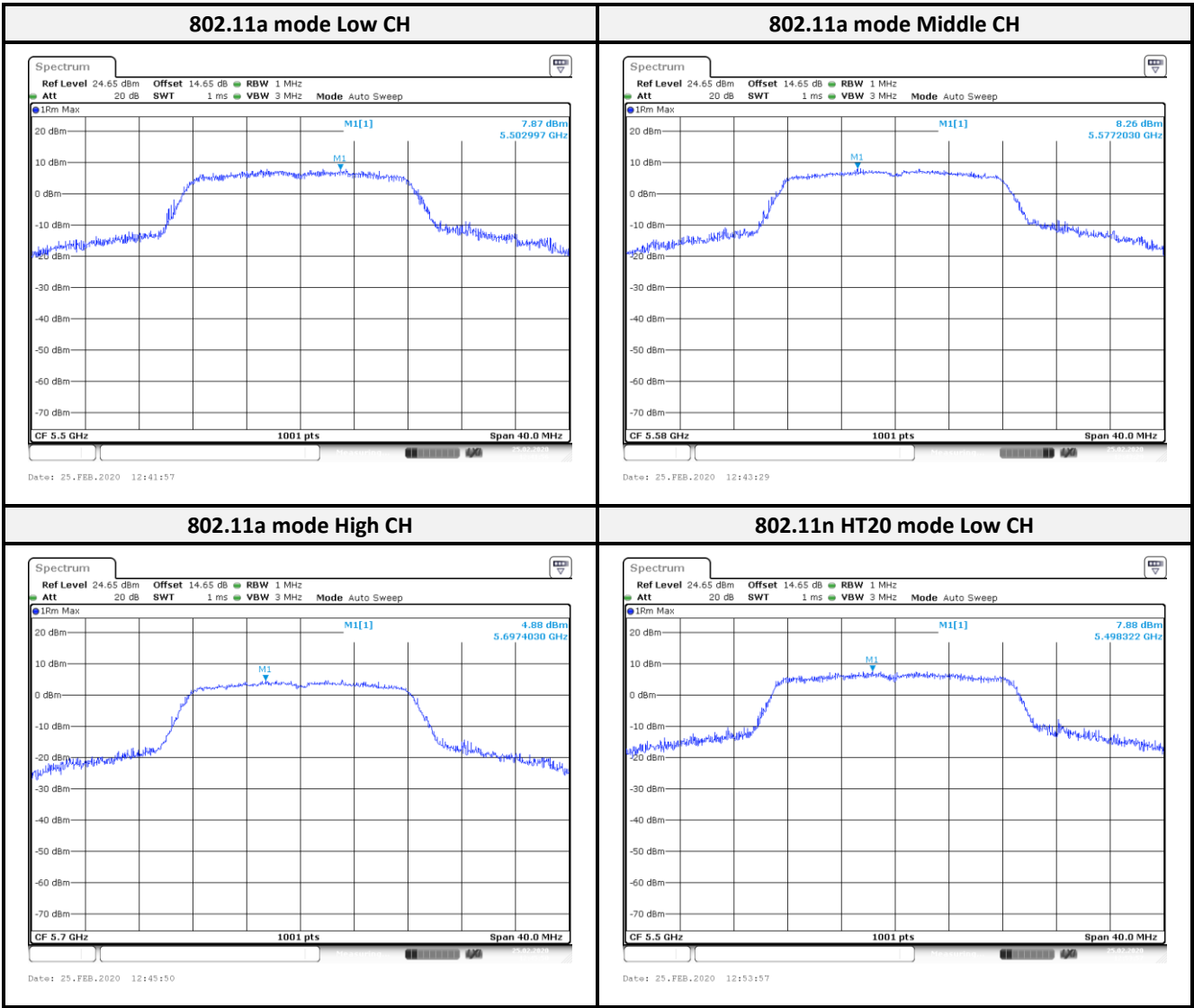


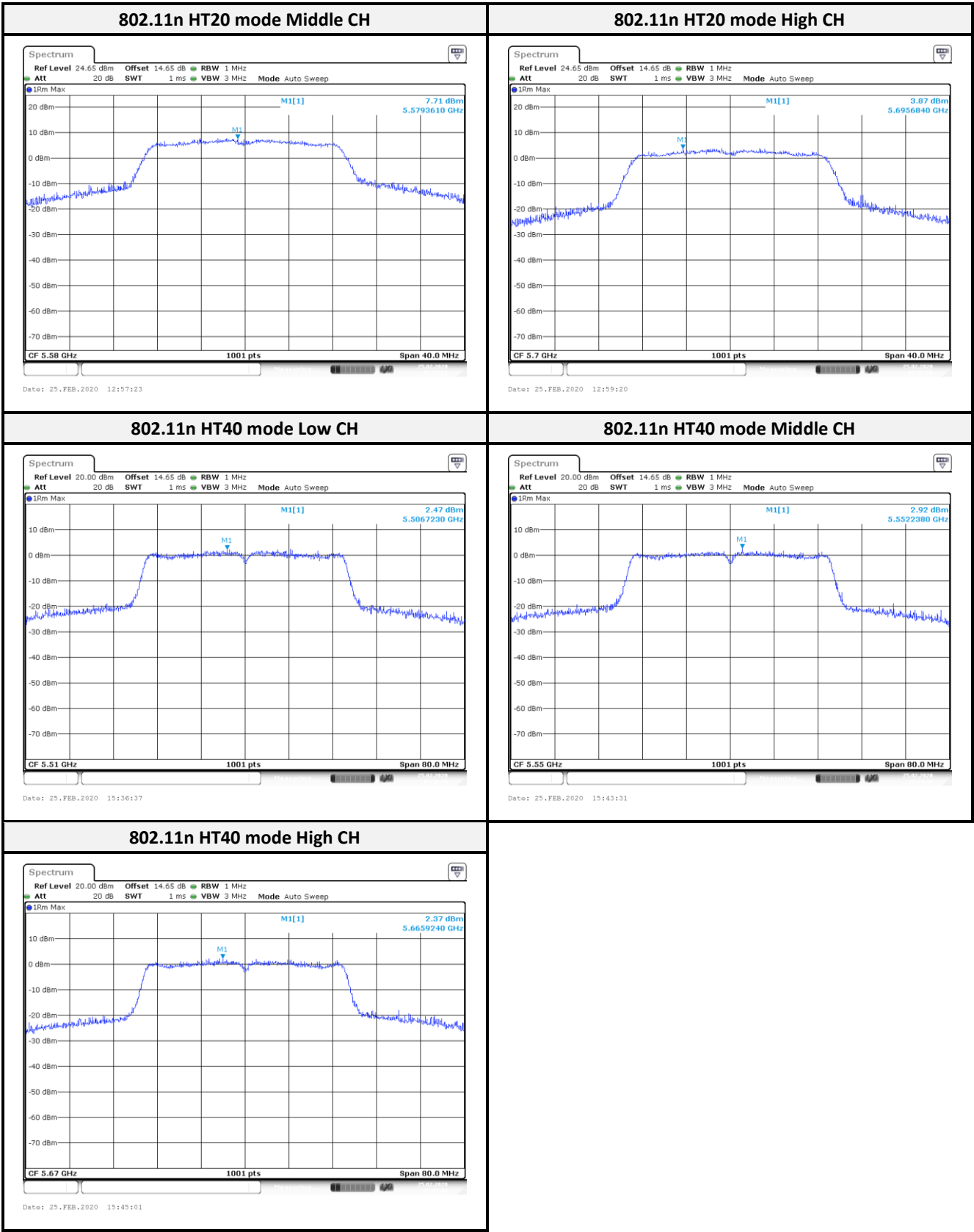
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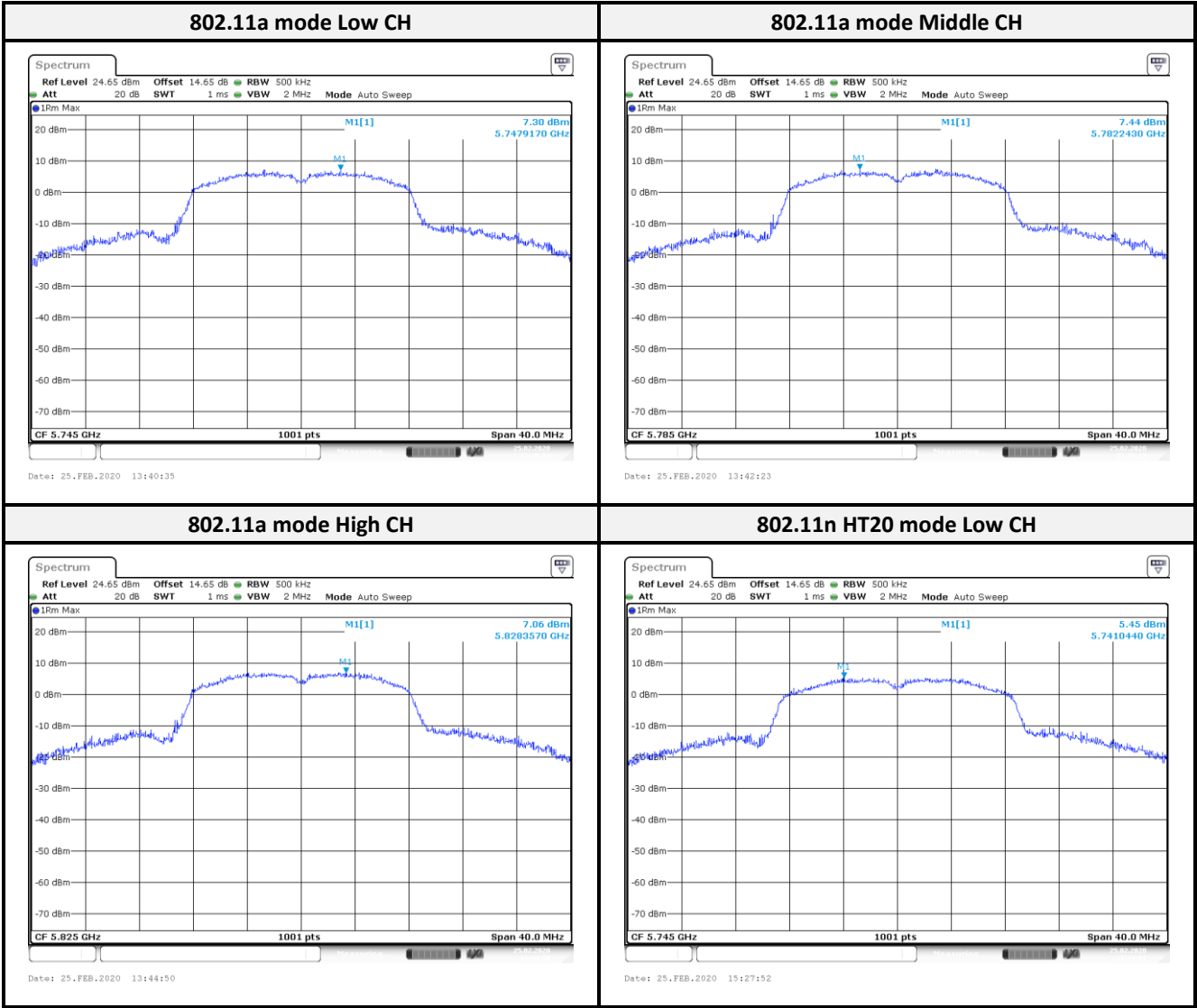


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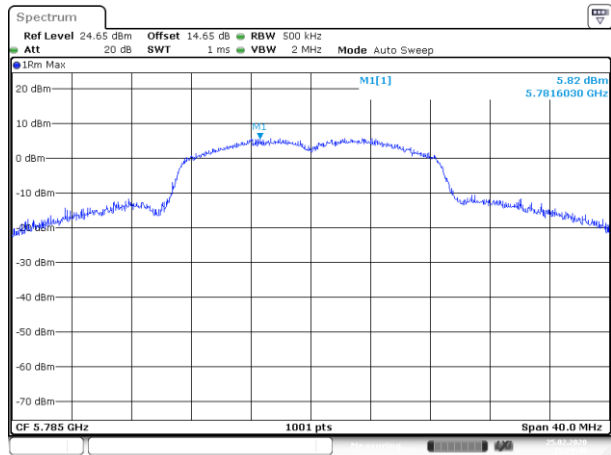




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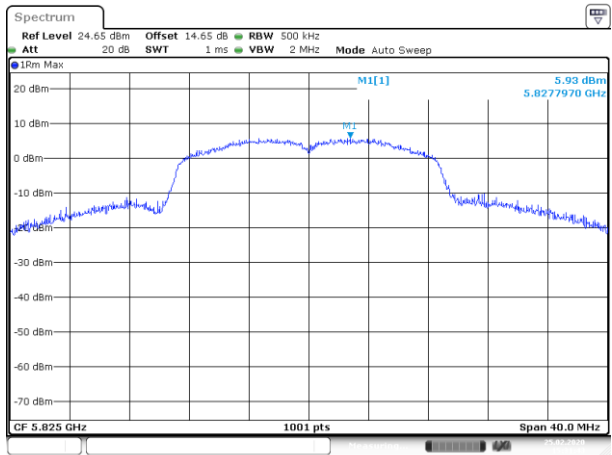


802.11n HT20 mode Middle CH



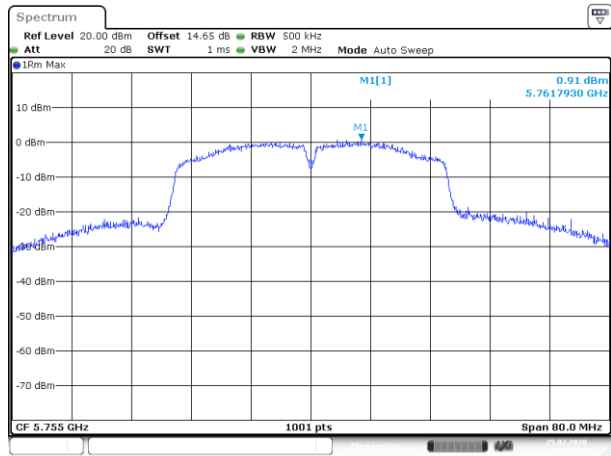
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802.11n HT20 mode High CH



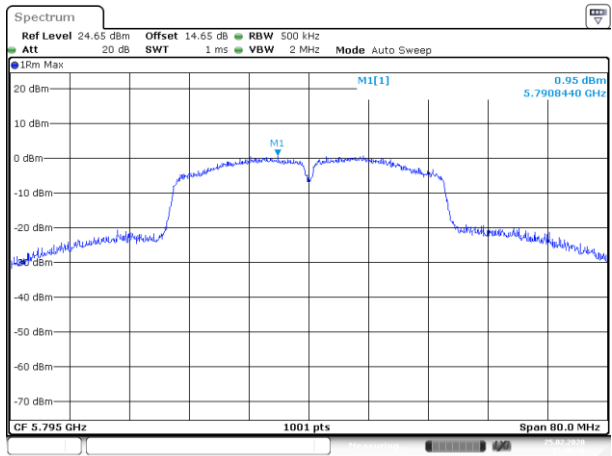
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802.11n HT40 mode Low CH



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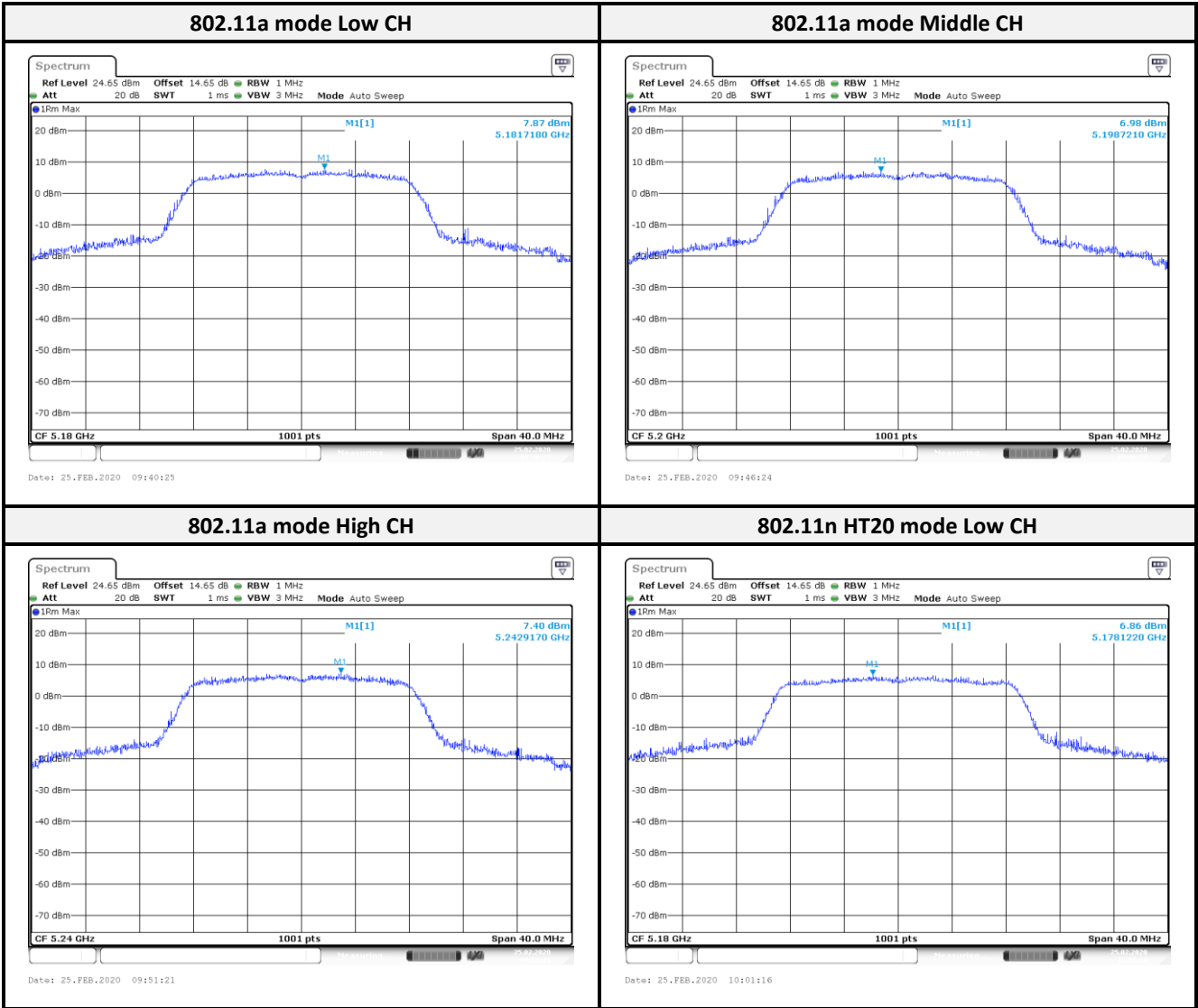
802.11n HT40 mode High CH



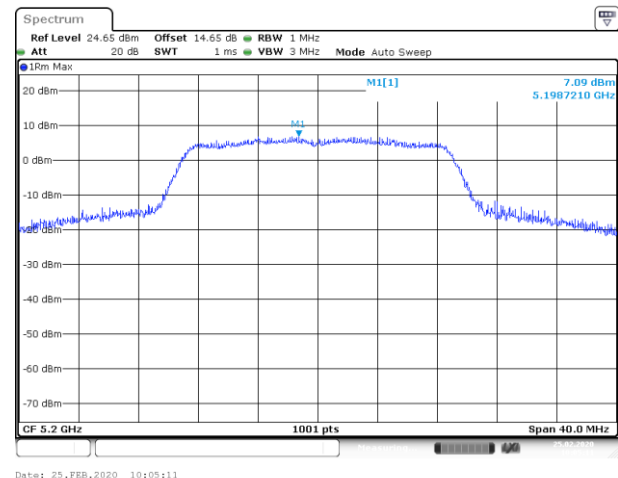
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< Dipole antenna (Inside WLAN PRO-IS-299)>

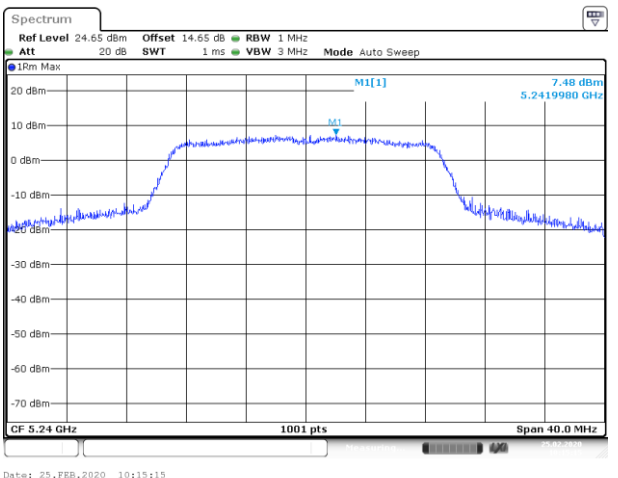
For UNII-1



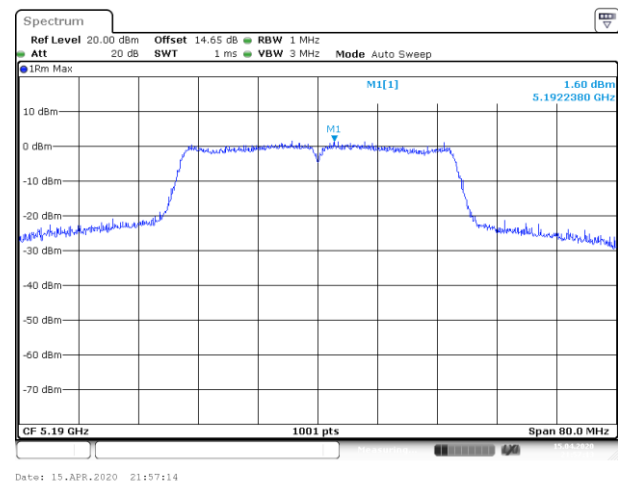
802.11n HT20 mode Middle CH



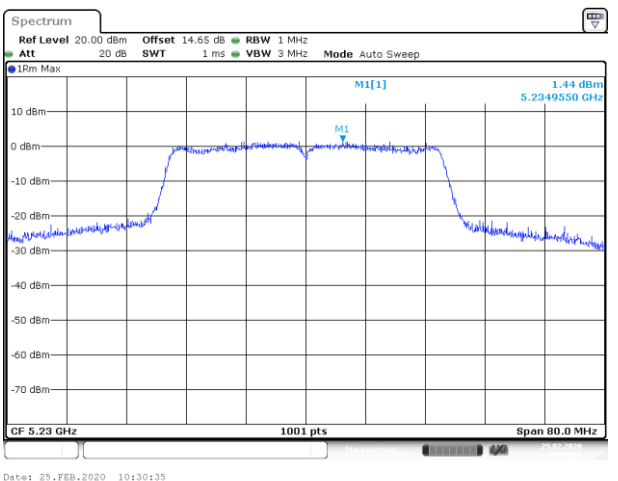
802.11n HT20 mode High CH



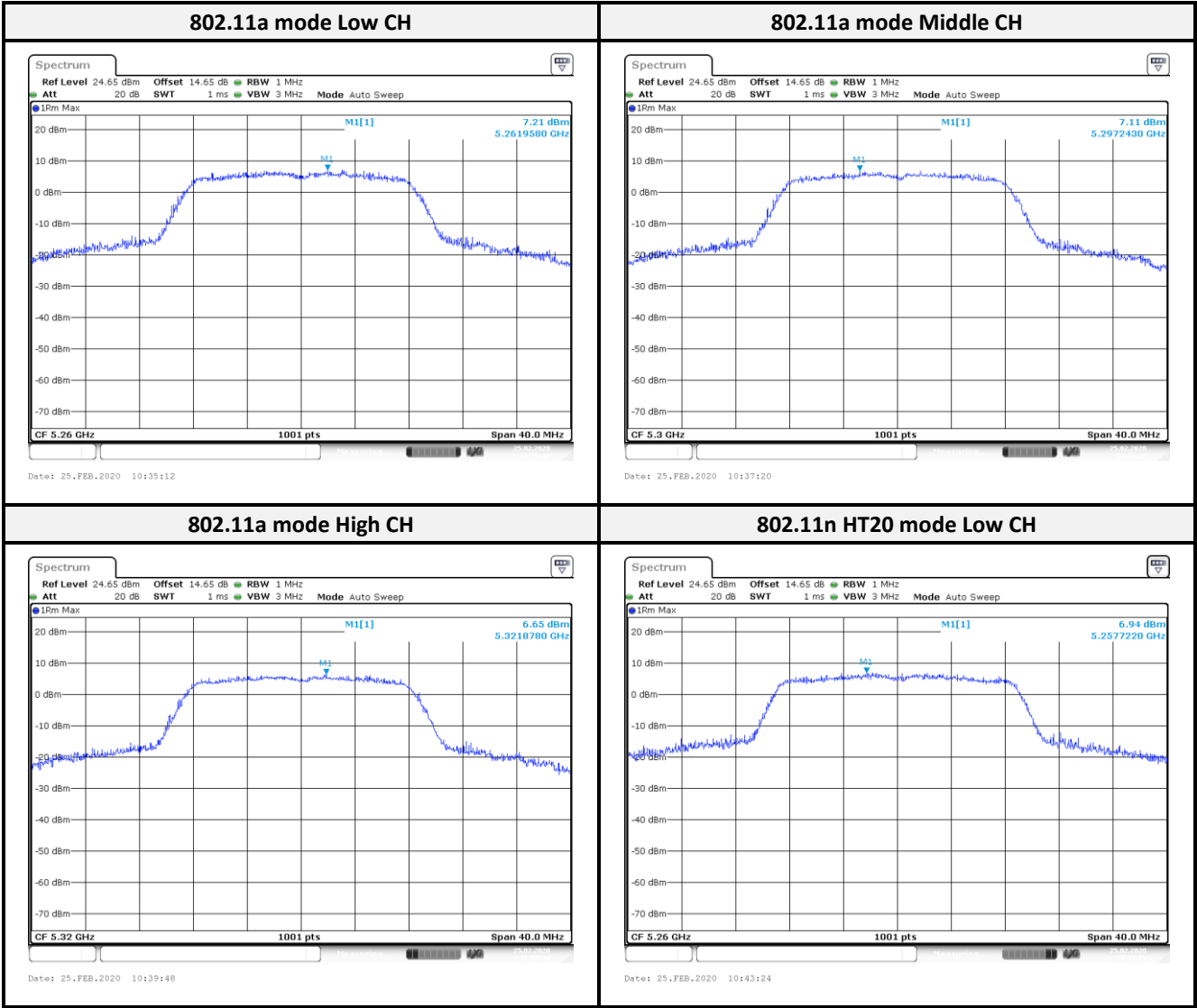
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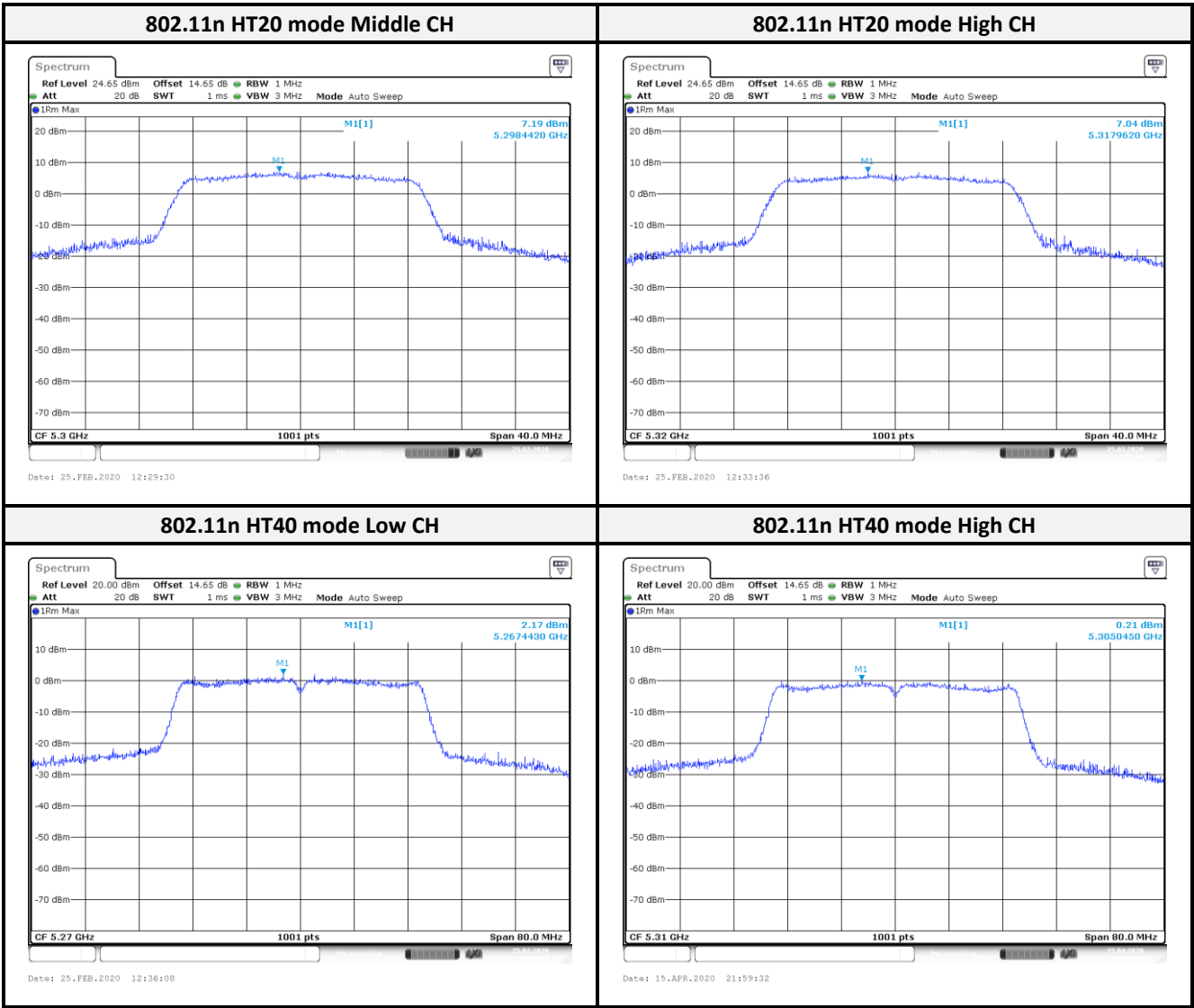


802.11n HT40 mode High CH

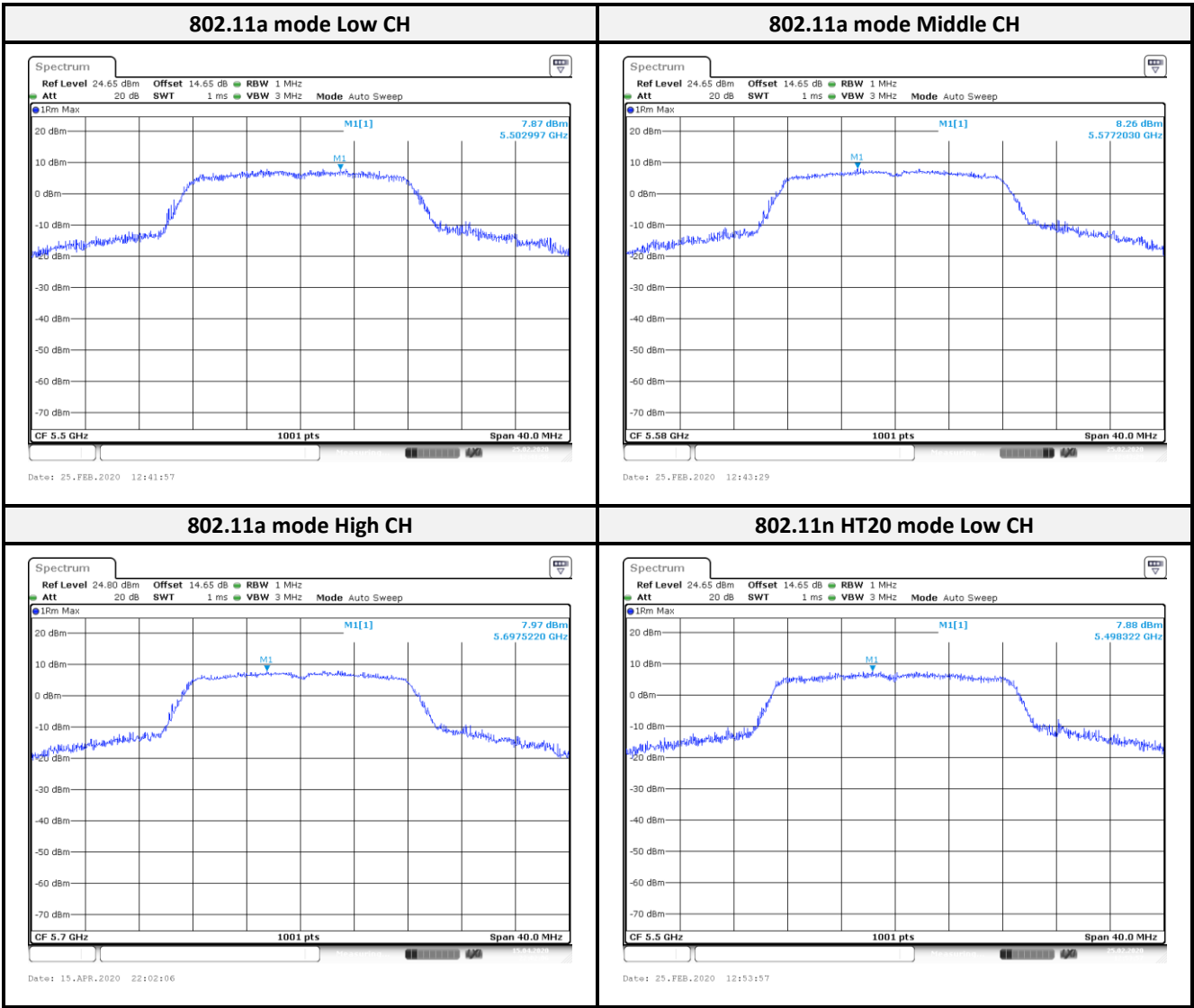


For UNII-2a

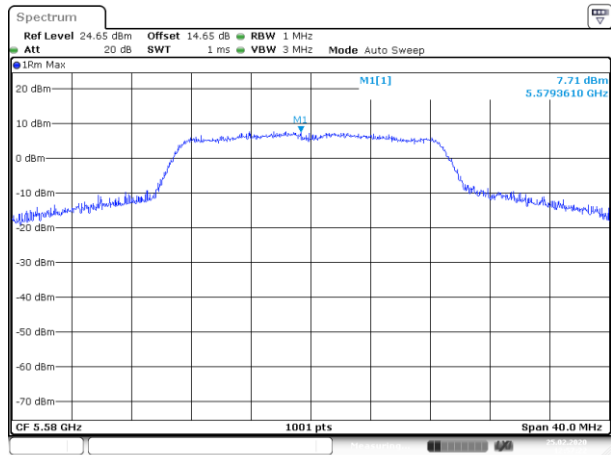




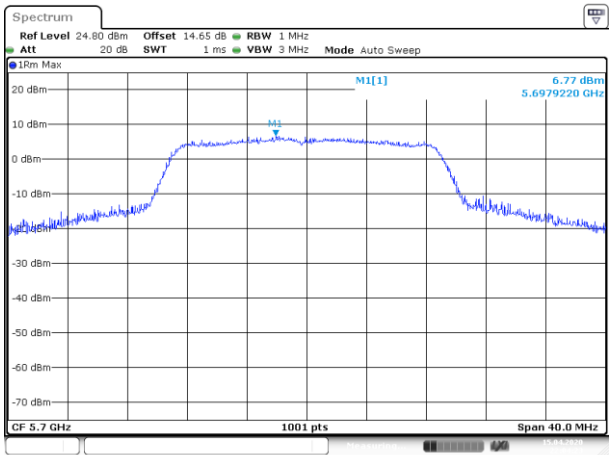
For UNII-2c



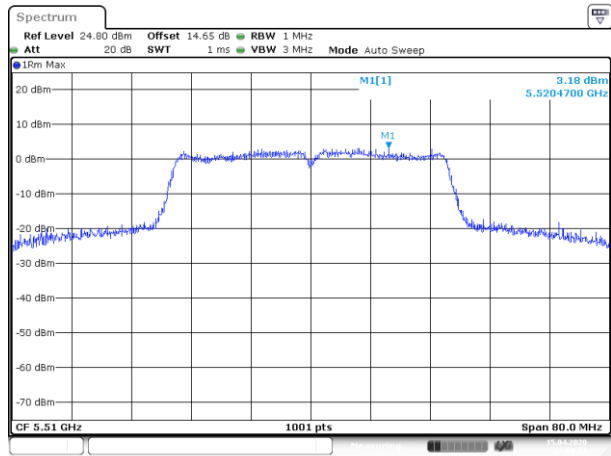
802.11n HT20 mode Middle CH



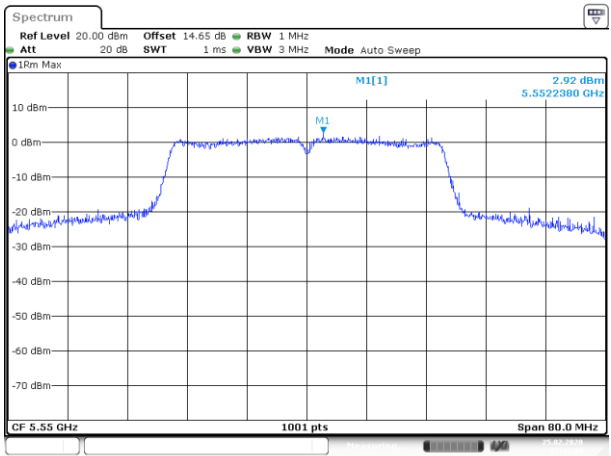
802.11n HT20 mode High CH



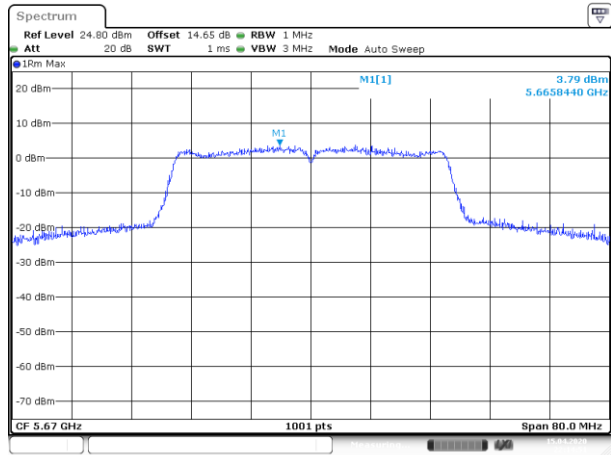
802.11n HT40 mode Low CH



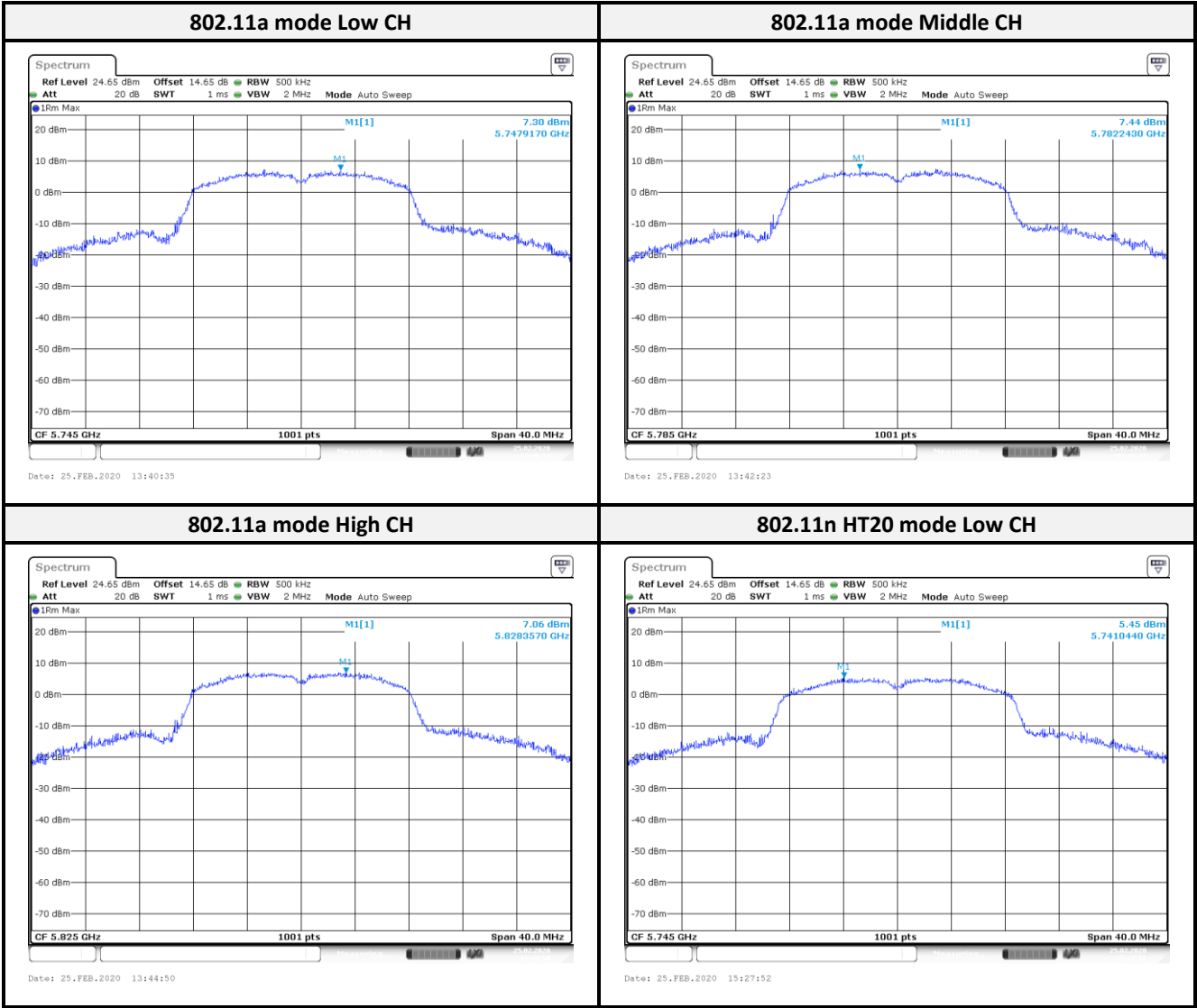
802.11n HT40 mode Middle CH



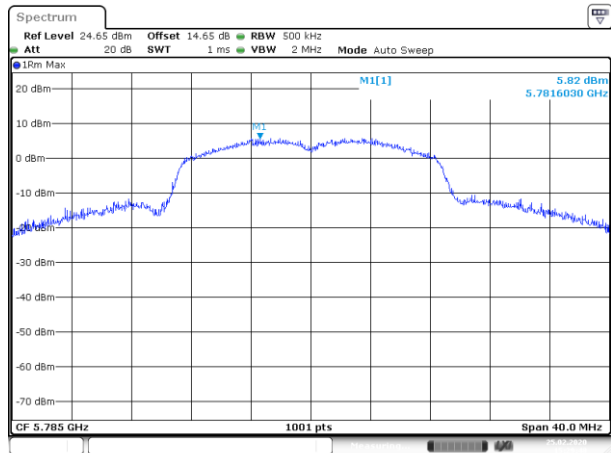
802.11n HT40 mode High CH



For UNII-3

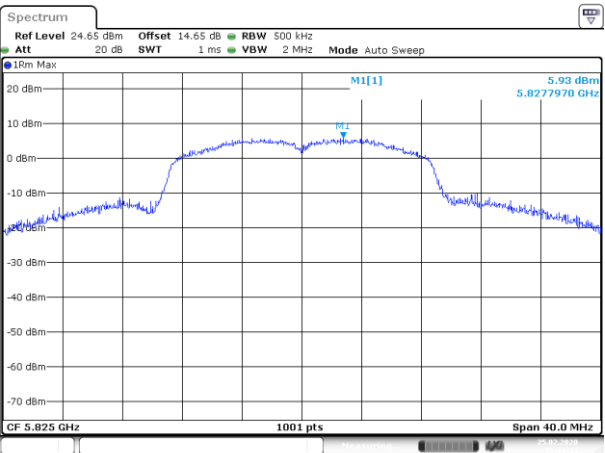


802.11n HT20 mode Middle CH



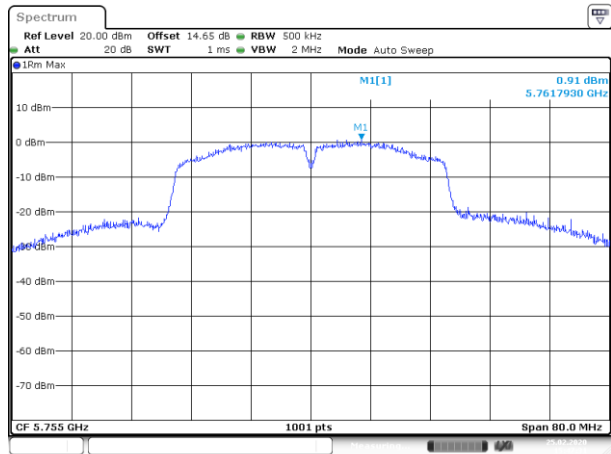
Date: 25.FEB.2020 15:29:49

802.11n HT20 mode High CH



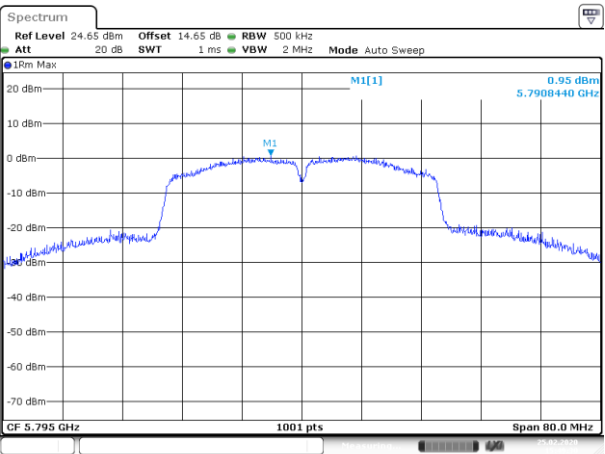
Date: 25.FEB.2020 15:31:44

802.11n HT40 mode Low CH



Date: 25.FEB.2020 15:47:32

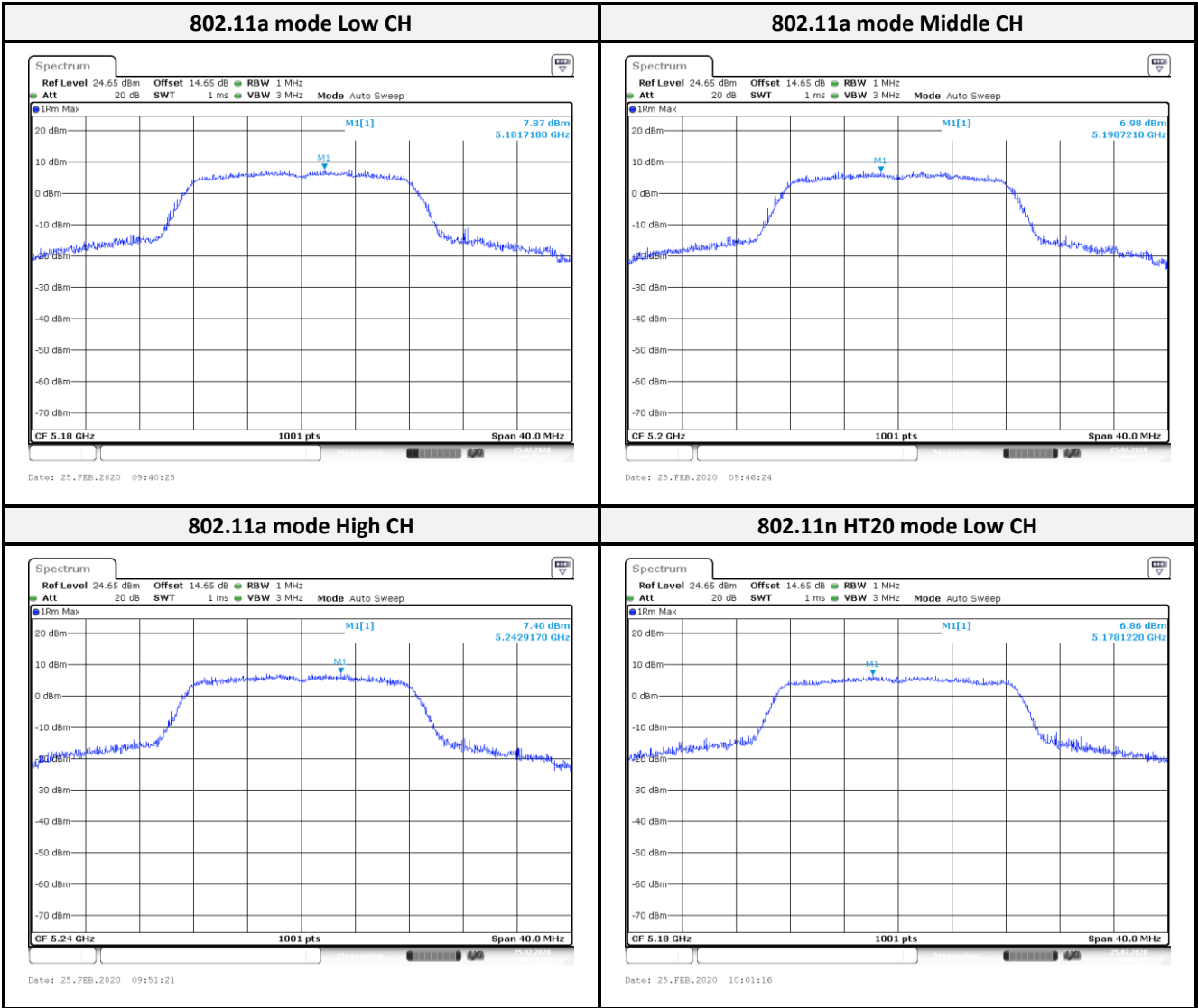
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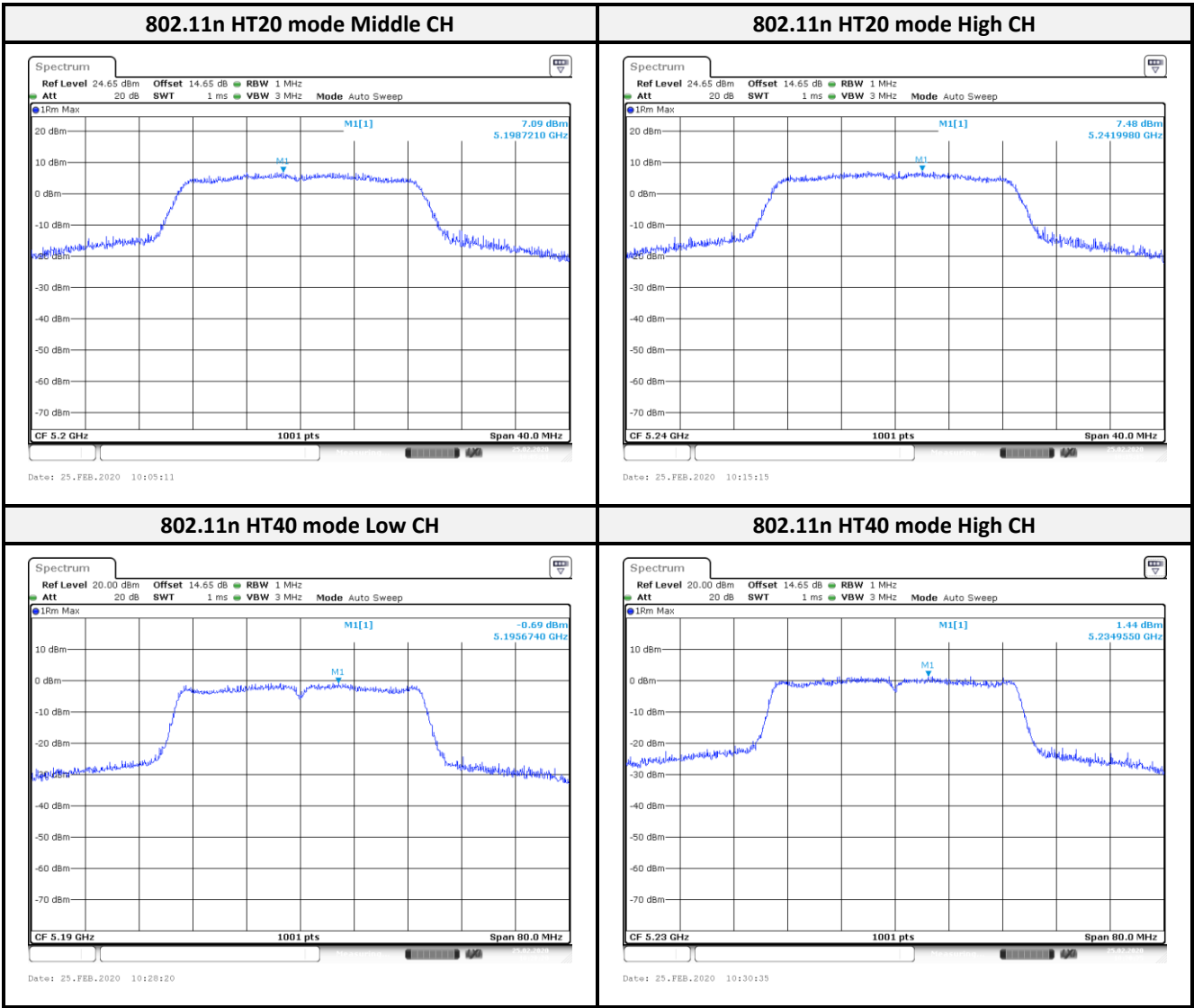


Date: 25.FEB.2020 15:49:30

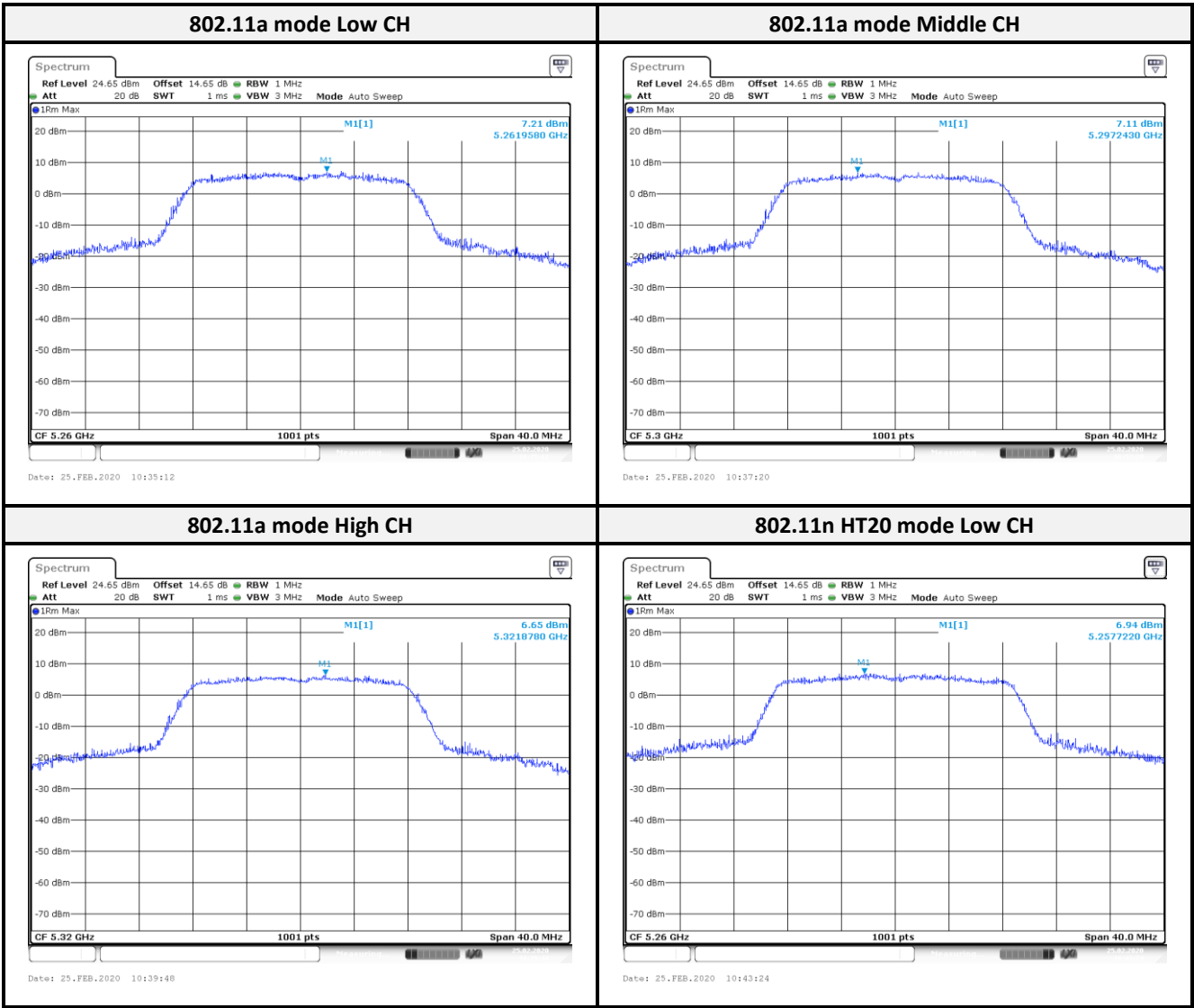
< PCB Antenna (Redpine Signals RSIA7)>

For UNII-1

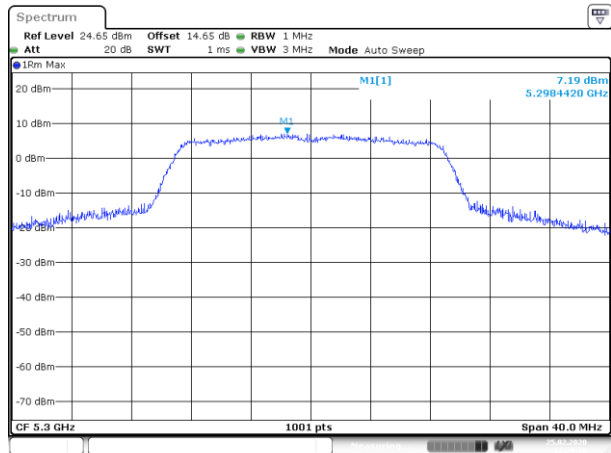




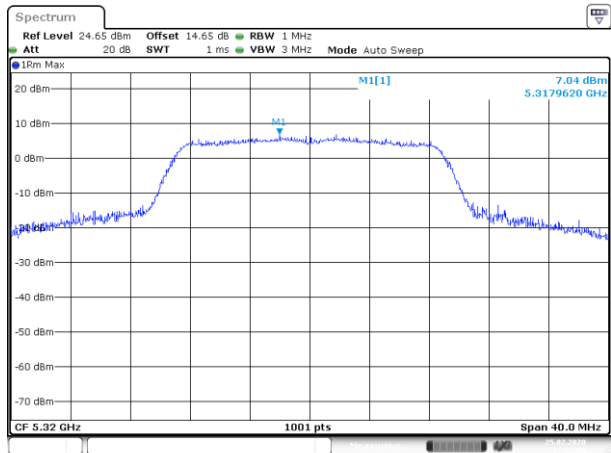
For UNII-2a



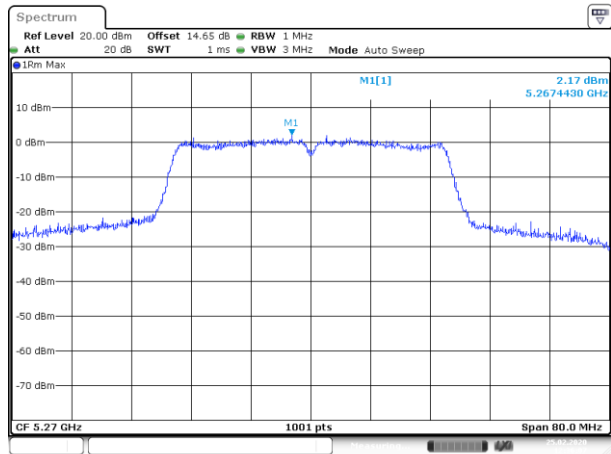
802.11n HT20 mode Middle CH



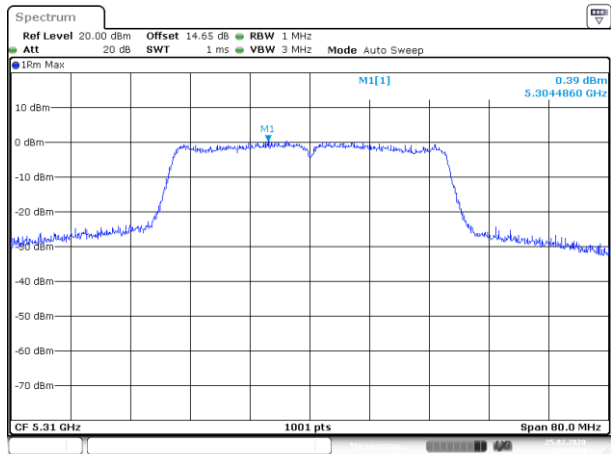
802.11n HT20 mode High CH



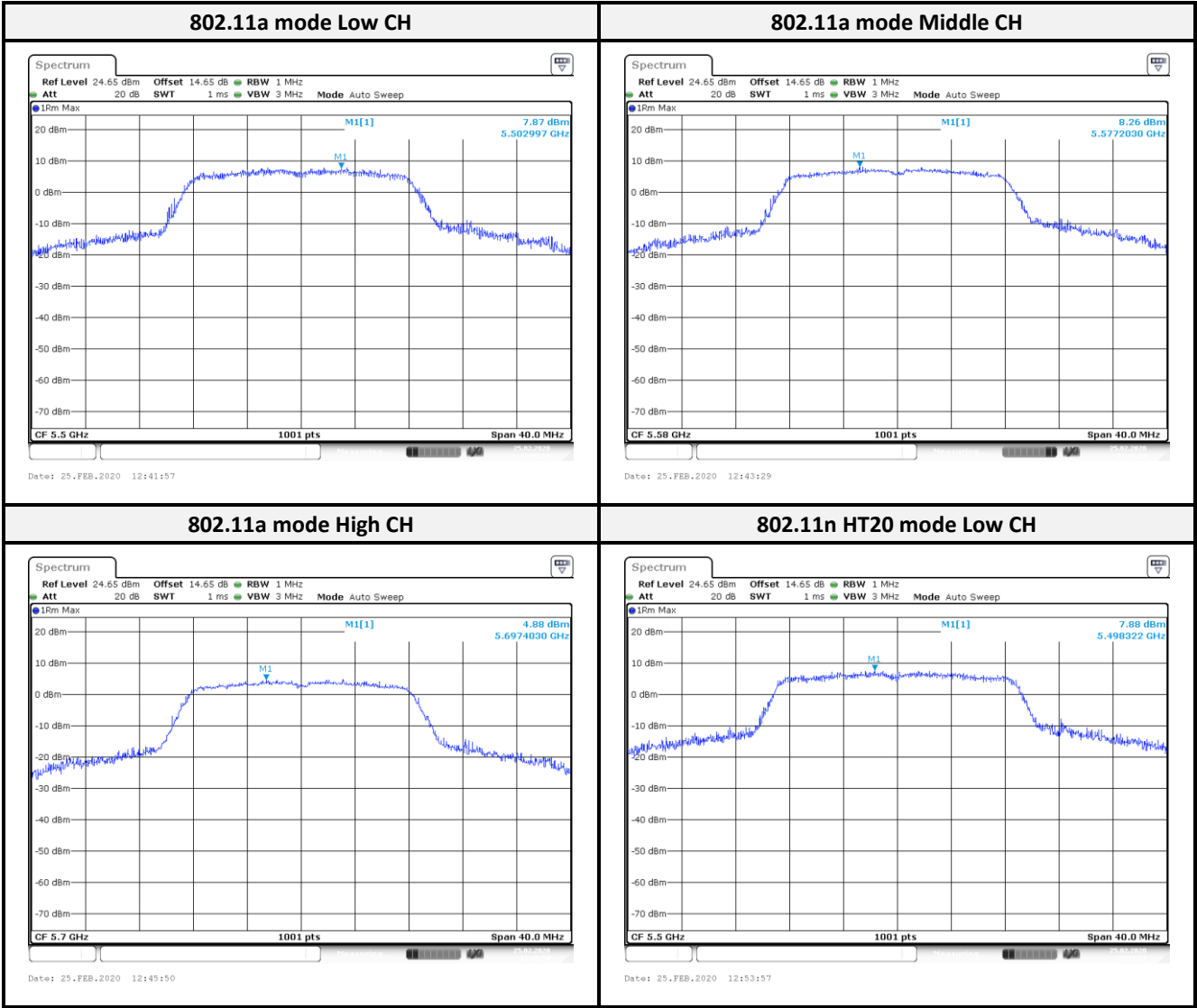
802.11n HT40 mode Low CH



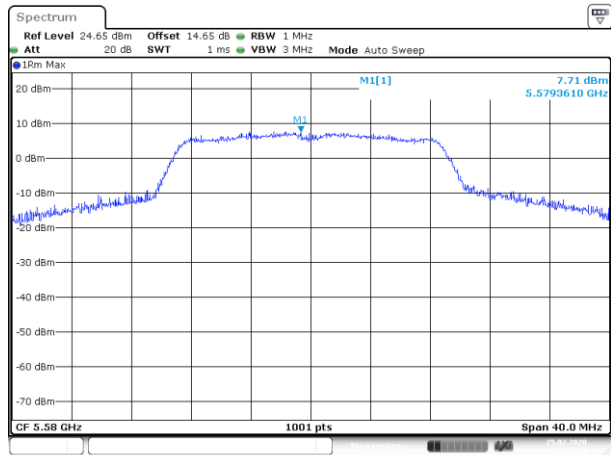
802.11n HT40 mode High CH



For UNII-2c

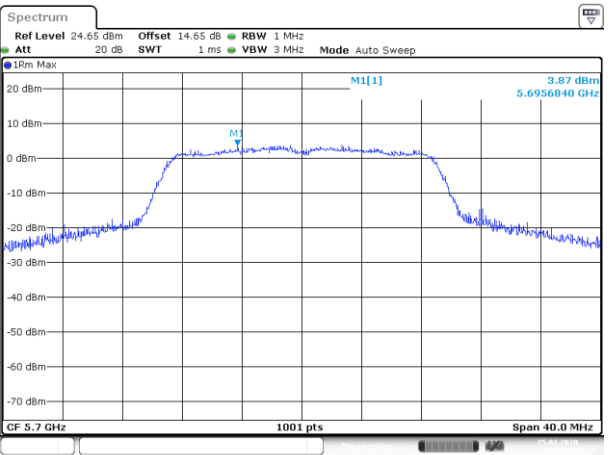


802.11n HT20 mode Middle CH



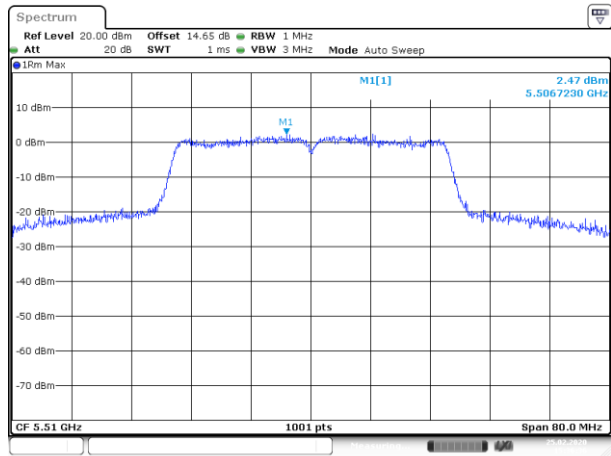
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802.11n HT20 mode High CH



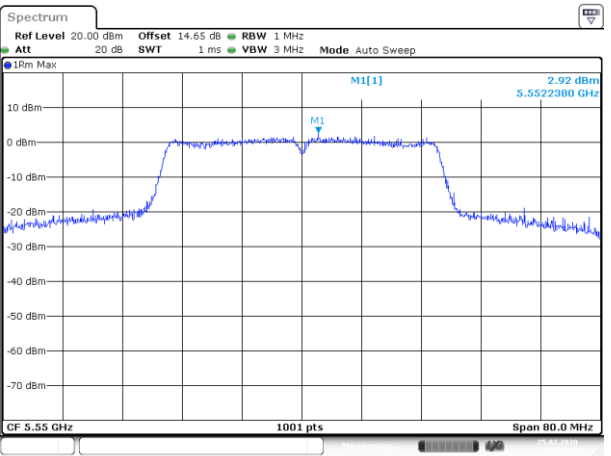
Date: 25.FEB.2020 12:59:20

802.11n HT40 mode Low CH



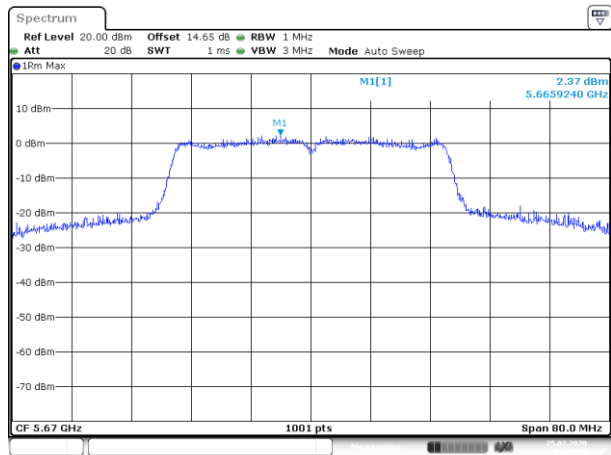
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802.11n HT40 mode Middle CH



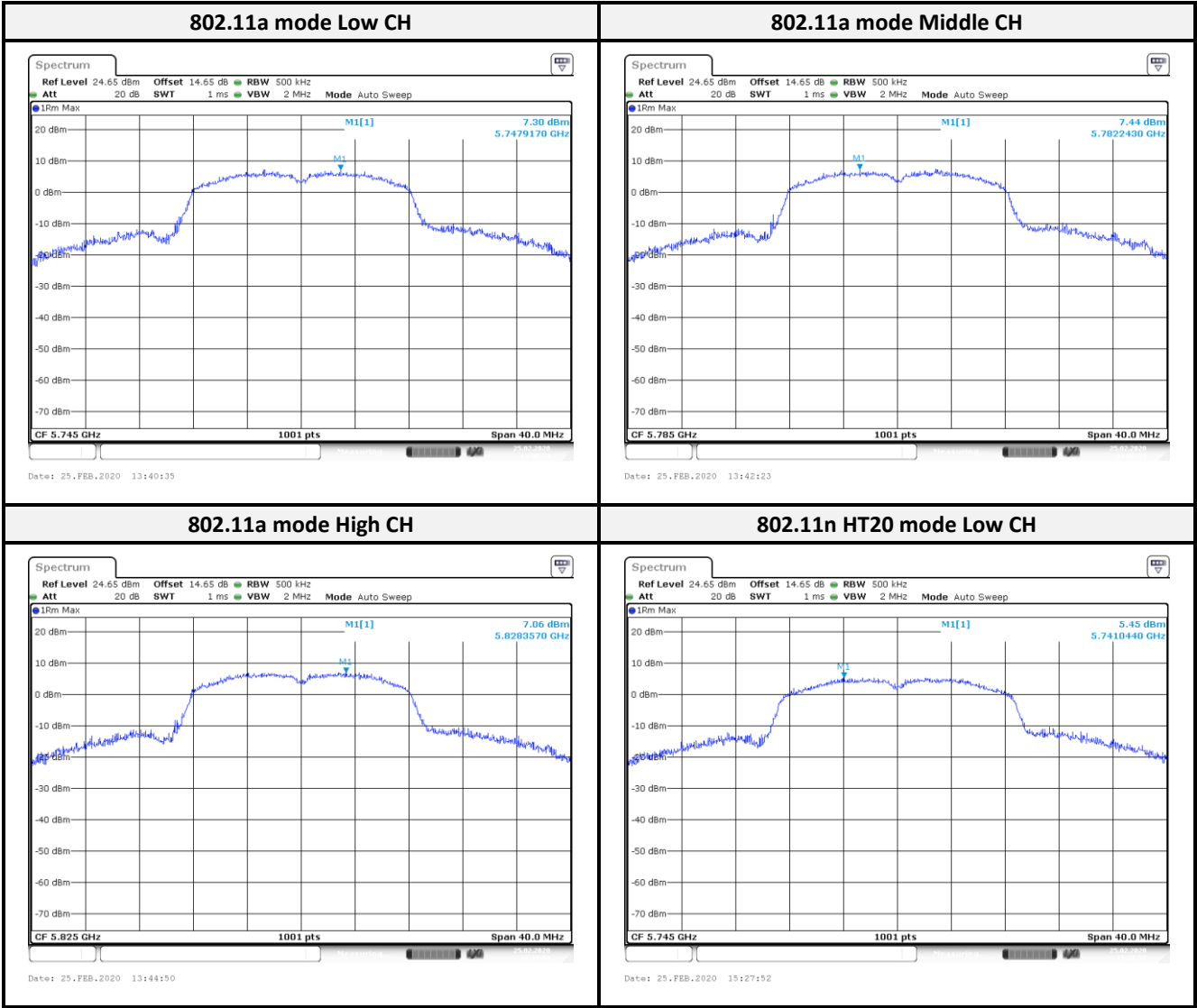
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802.11n HT40 mode High CH

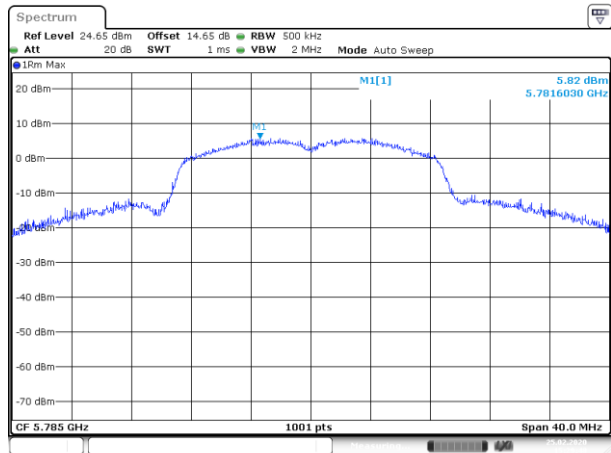


Date: 25.FEB.2020 15:45:01

For UNII-3

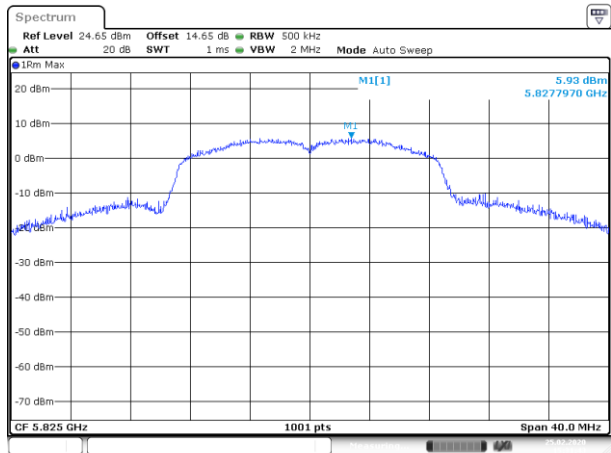


802.11n HT20 mode Middle CH



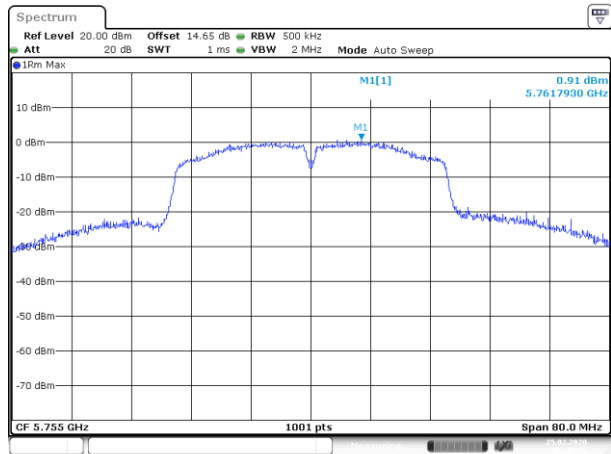
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802.11n HT20 mode High CH



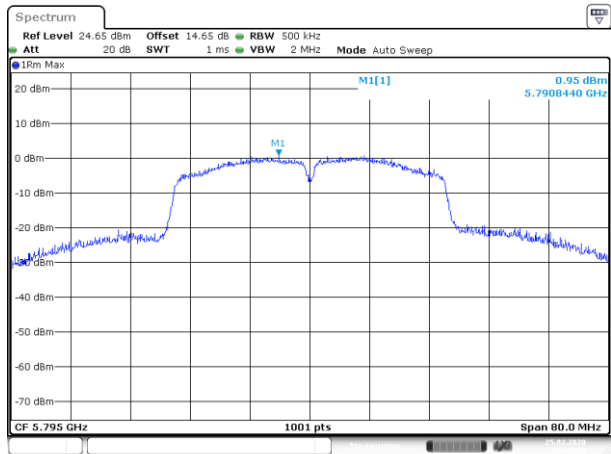
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802.11n HT40 mode Low CH



Date: 25.FEB.2020 15:47:32

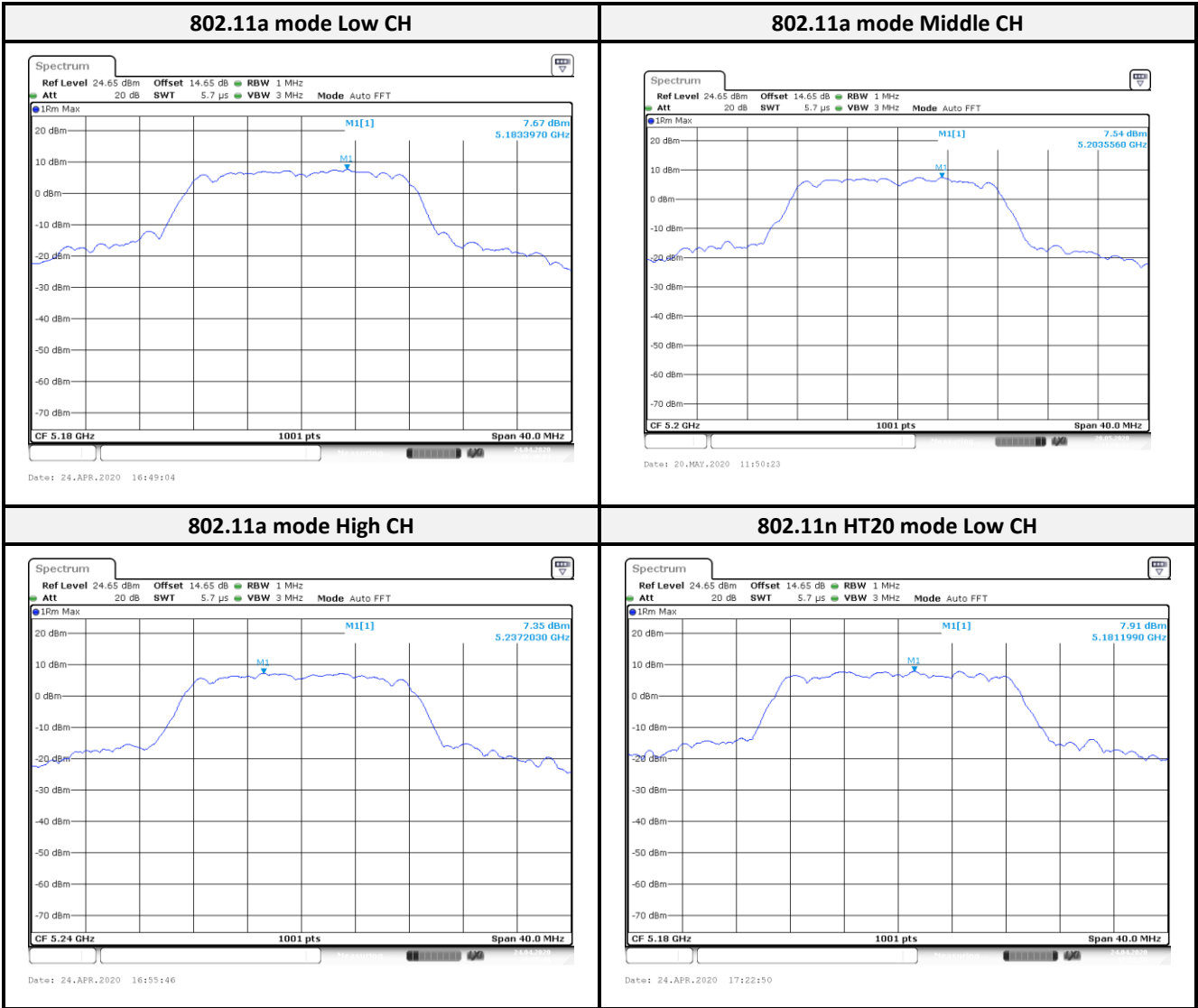
802.11n HT40 mode High CH

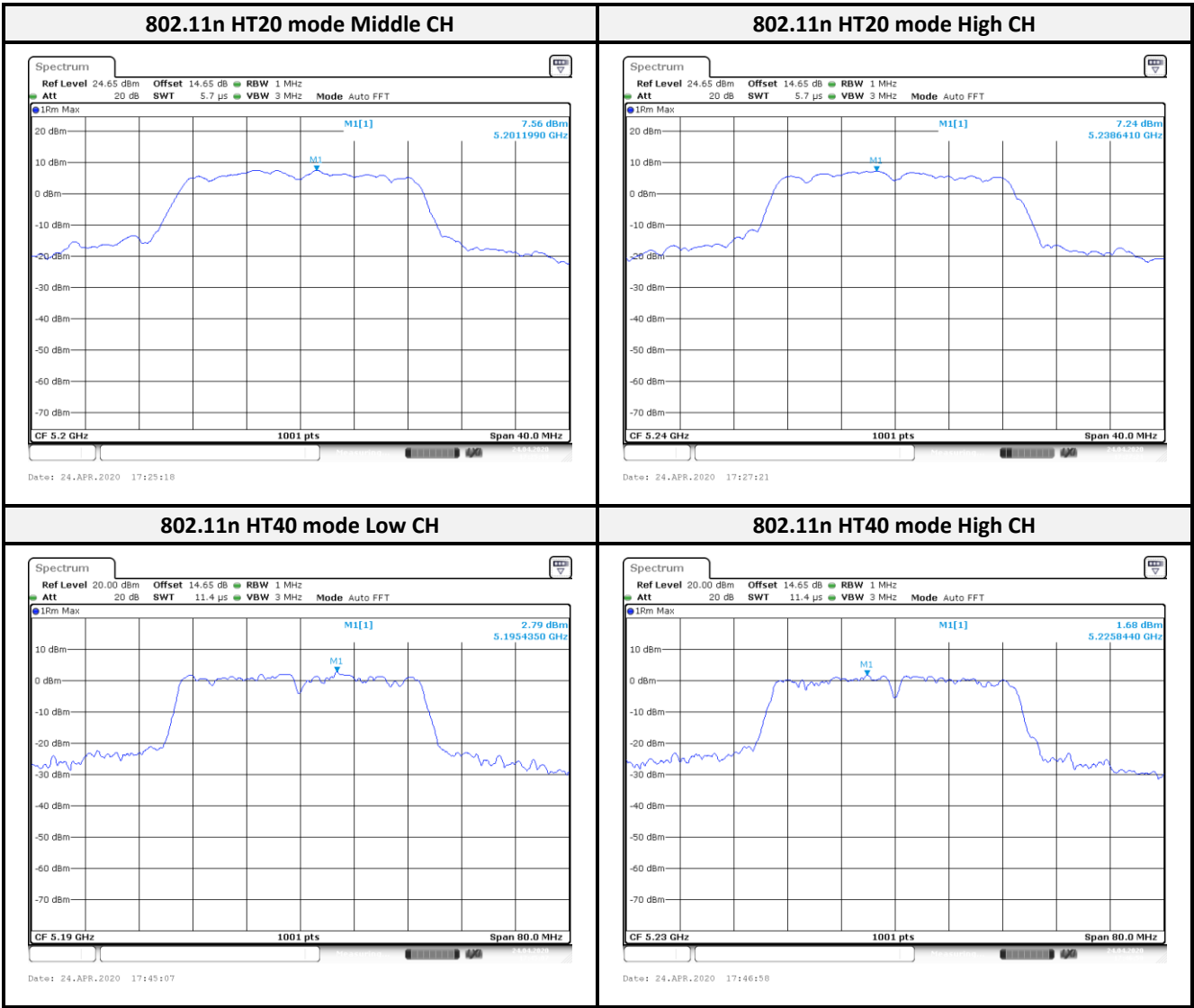


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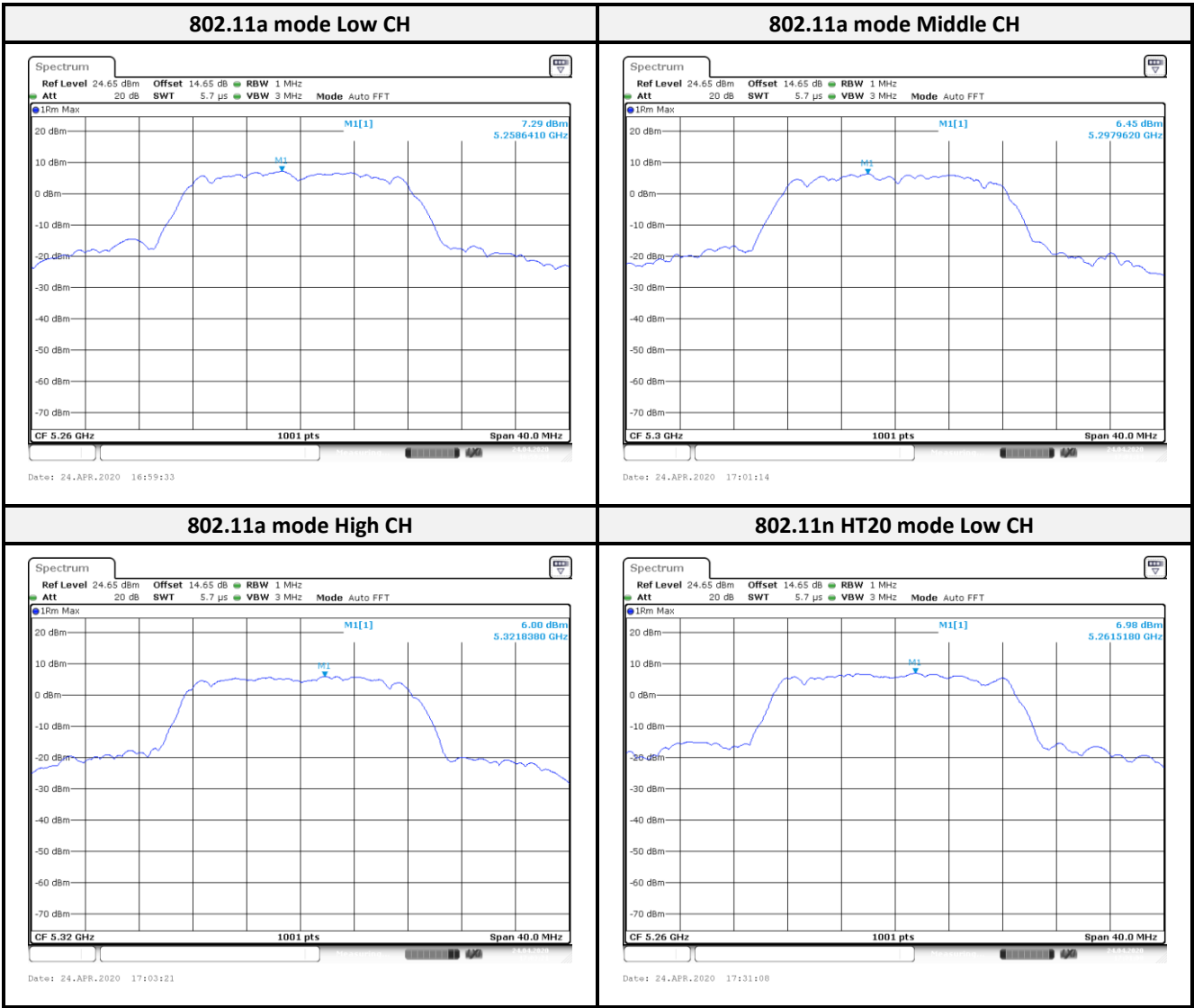
< PIFA Antenna (SMARTEQ 4211613980)>

For UNII-1

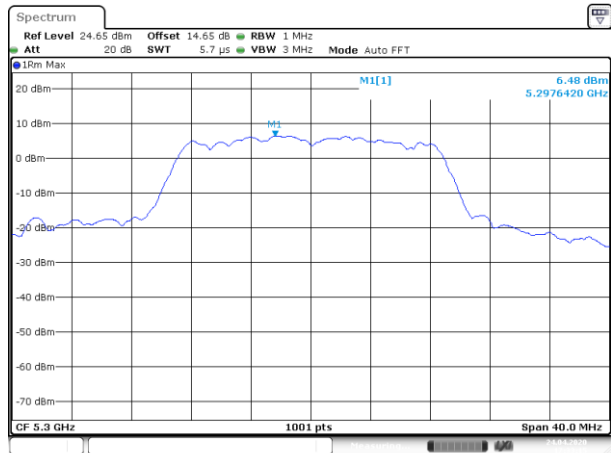




For UNII-2a

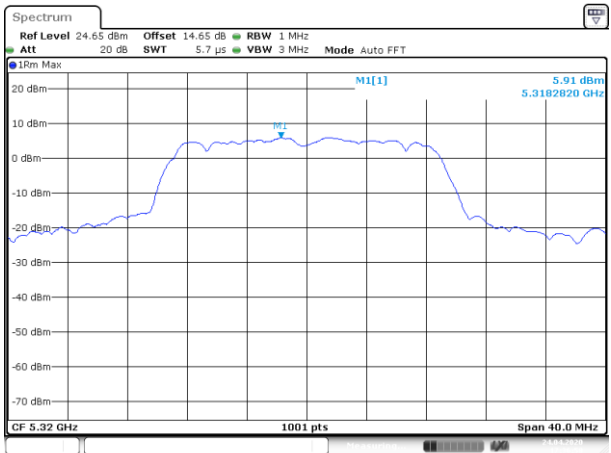


802.11n HT20 mode Middle CH



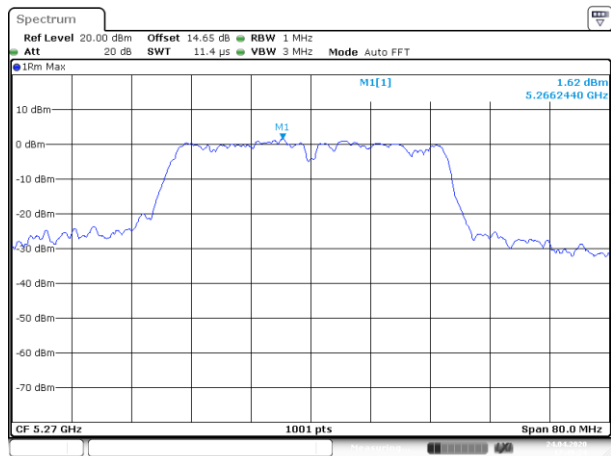
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802.11n HT20 mode High CH



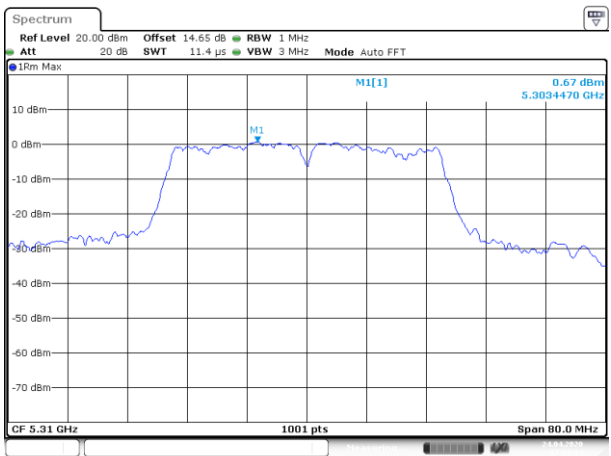
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802.11n HT40 mode Low CH



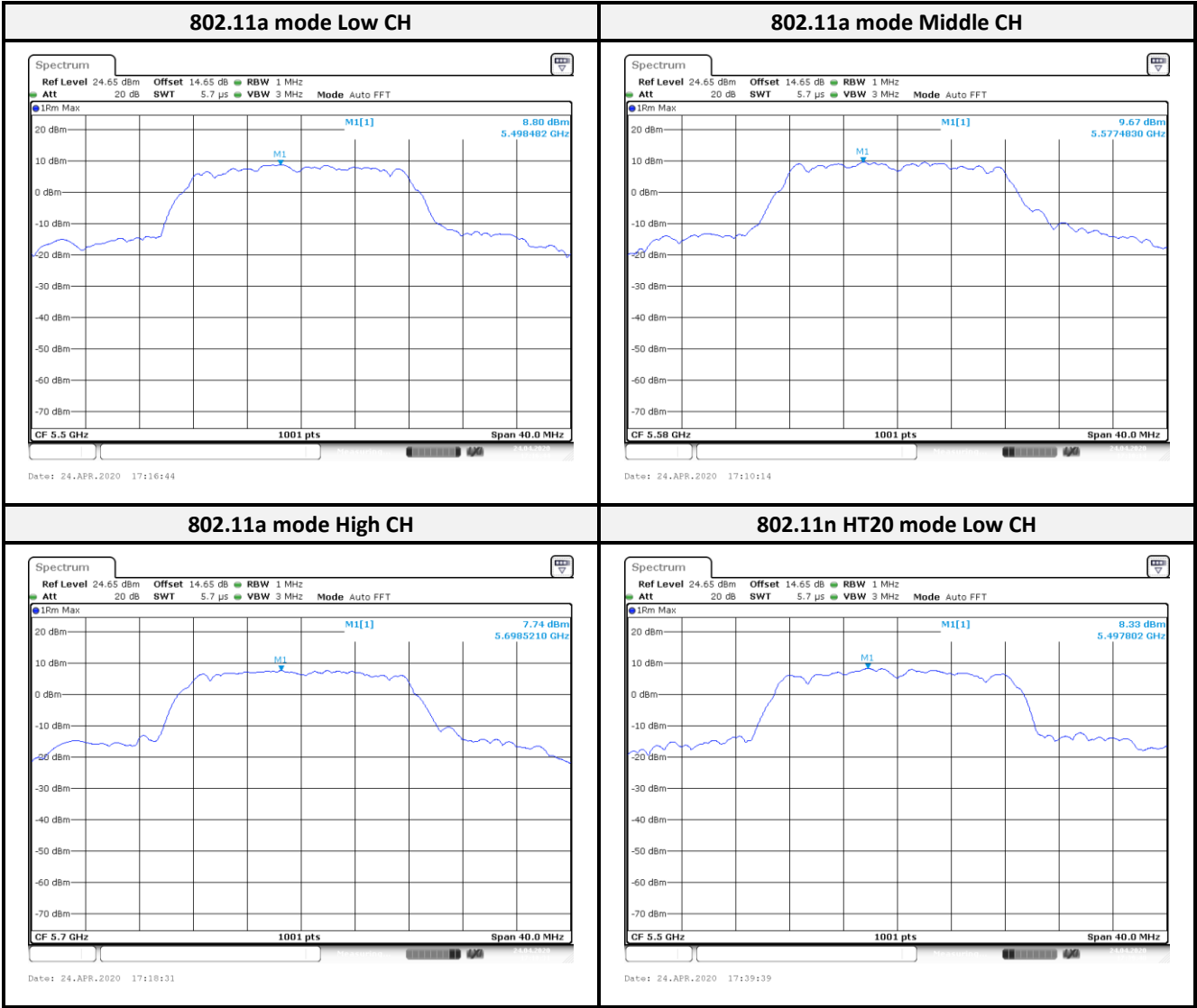
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802.11n HT40 mode High CH

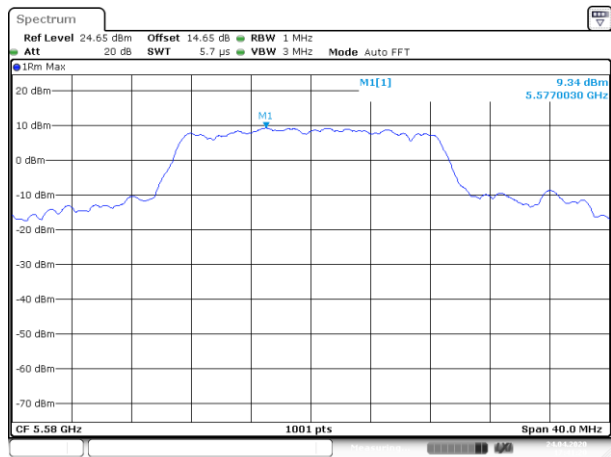


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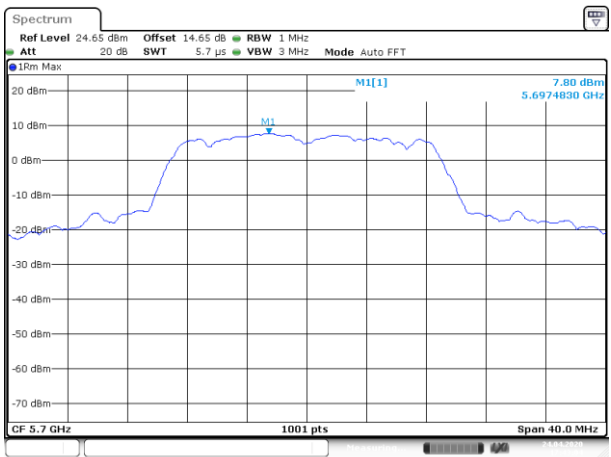
For UNII-2c



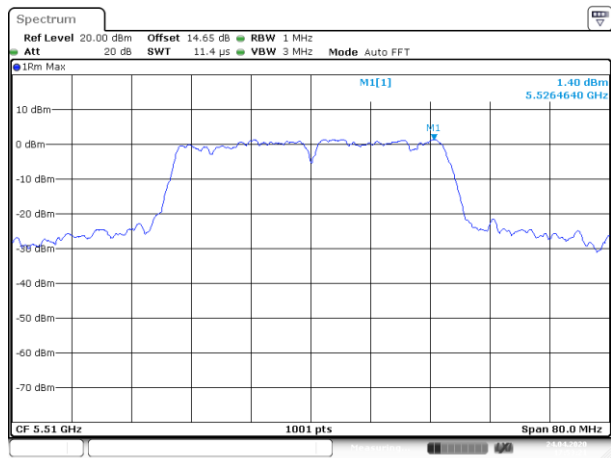
802.11n HT20 mode Middle CH



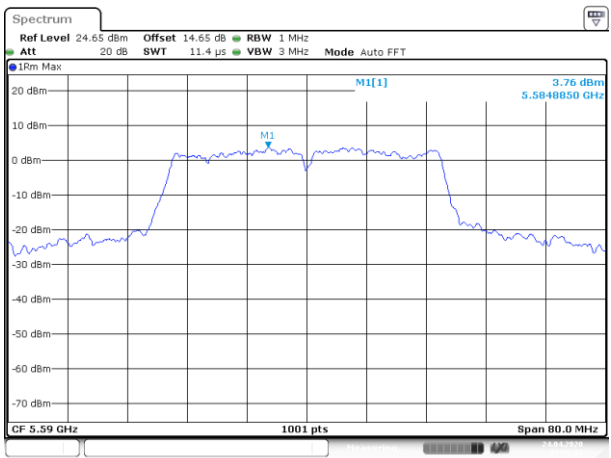
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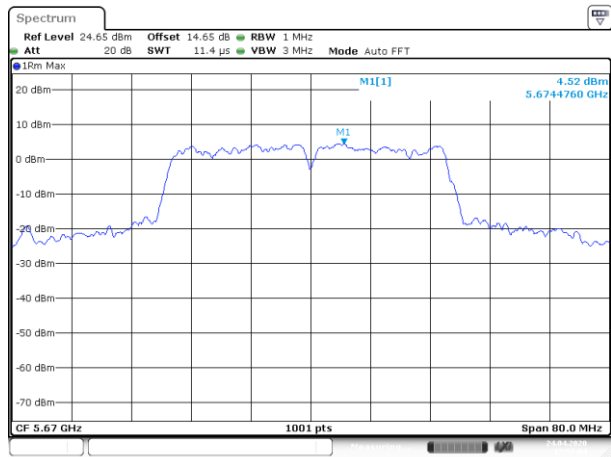
802.11n HT40 mode Low CH



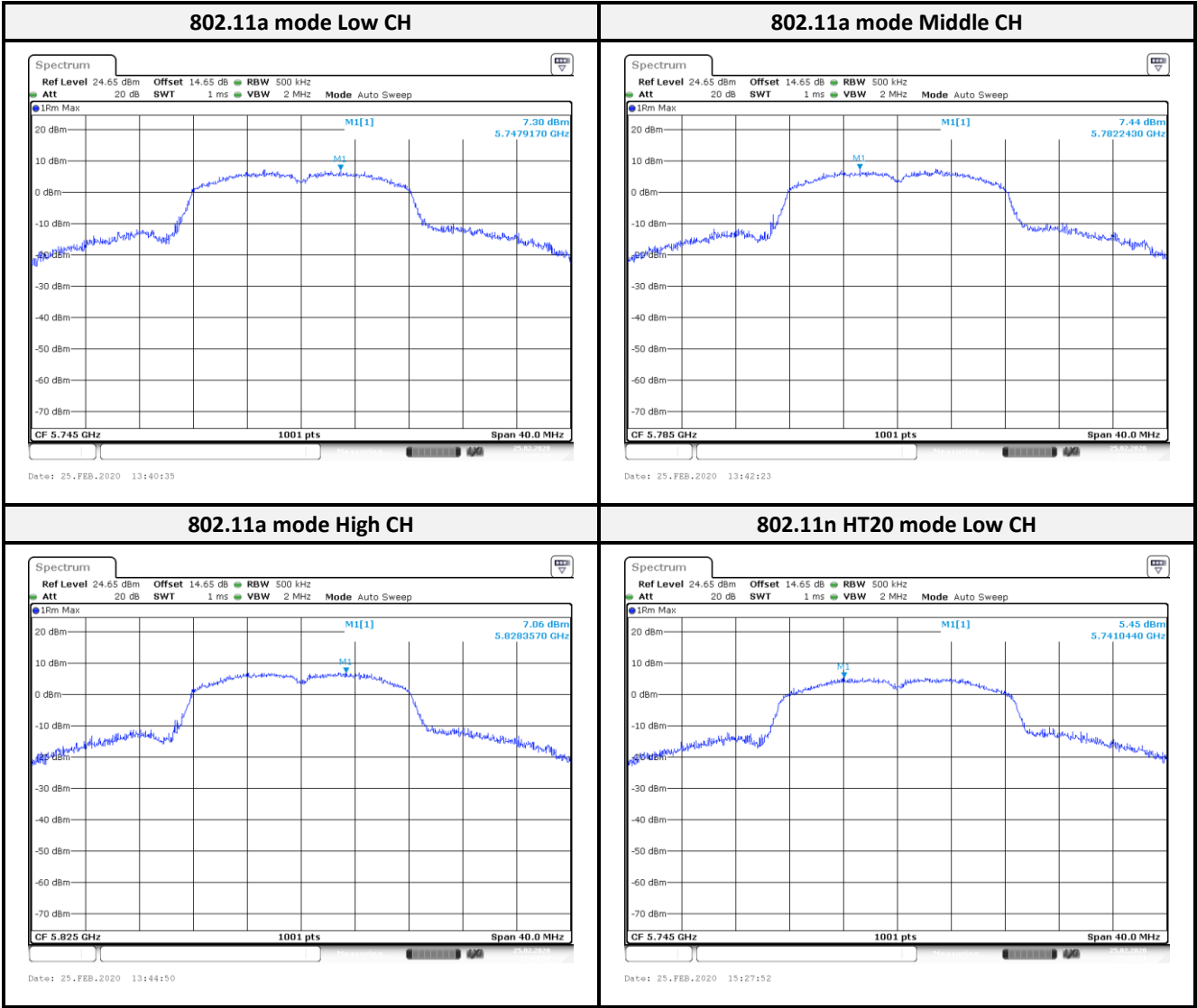
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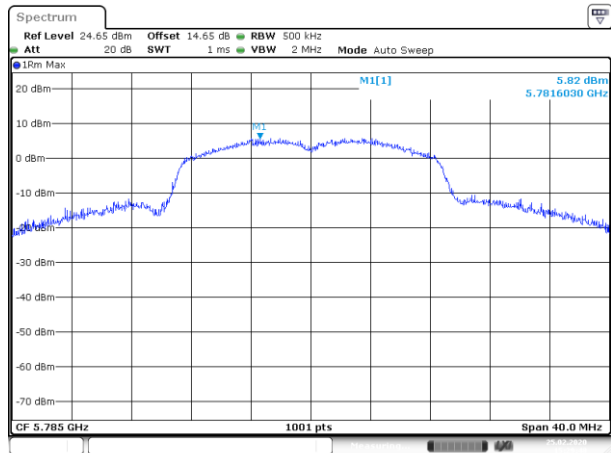
802.11n HT40 mode High CH



For UNII-3

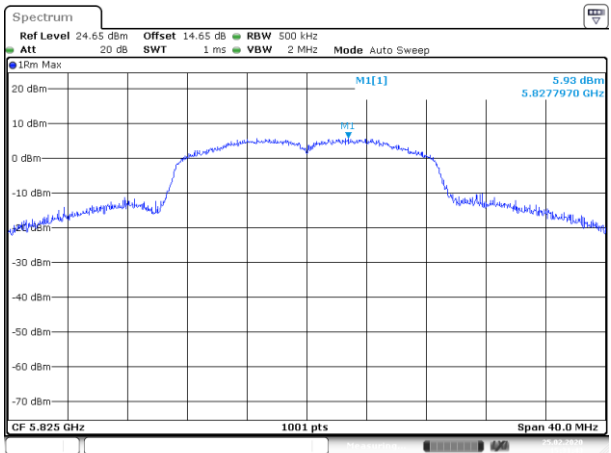


802.11n HT20 mode Middle CH



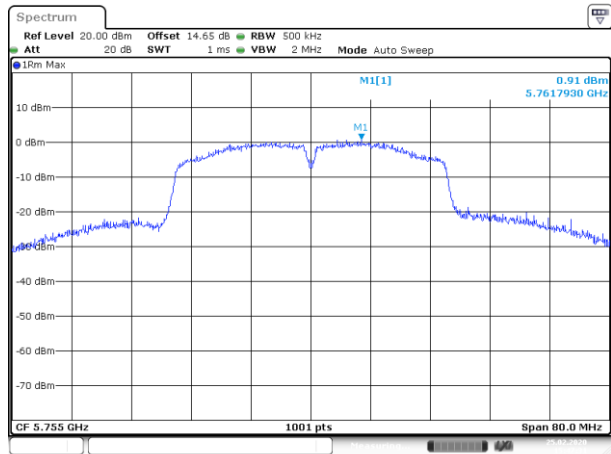
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802.11n HT20 mode High CH



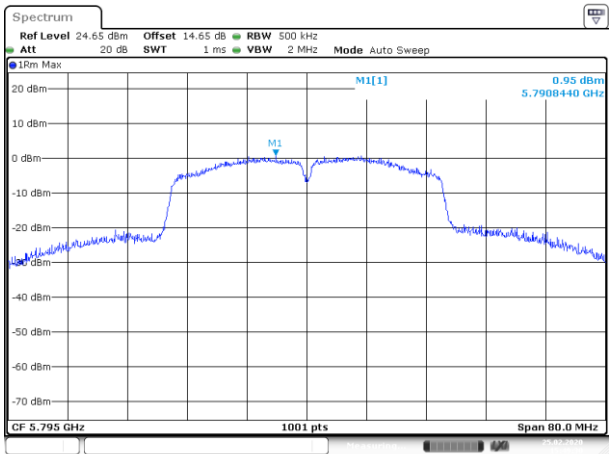
Date: 25.FEB.2020 15:31:44

802.11n HT40 mode Low CH



Date: 25.FEB.2020 15:47:32

802.11n HT40 mode High CH



Date: 25.FEB.2020 15:49:30

12 RSS-247 Sec 6.4 – Additional Requirements

12.1 Applicable Standard

The following requirements shall apply:

a) The device shall automatically discontinue transmission in cases of absence of information to transmit, or operational failure. A description on how this is done shall accompany the application for equipment certification. Note that this is not intended to prohibit transmission of control or signalling information or the use of repetitive codes where required by the technology.

b) All LE-LAN devices must contain security features to protect against modification of software by unauthorized parties. Manufacturers must implement security features in any digitally modulated devices capable of operating in any of the frequency ranges within the 5 GHz band, so that third parties are not able to reprogram the device to operate outside the parameters for which the device was certified. The software must prevent the user from operating the transmitter with operating frequencies, output power, modulation types or other radio frequency parameters outside those that were approved for the device. Manufacturers may use various means, including the use of a private network that allows only authenticated users to download software, electronic signatures in software or coding in hardware that is decoded by software to verify that new software can be legally loaded into a device to meet these requirements and must describe the methods in their application for equipment certification. Manufacturers must take steps to ensure that DFS functionality cannot be disabled by the operator of the LE-LAN device.

c) The user manual for LE-LAN devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

- i. the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;⁴
- ii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
- iii. for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits as appropriate; and
- iv. where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

12.2 Result

- RSS-247 Clause 6.4 a):

The device shall automatically discontinue transmission in cases of absence of information to transmit, or operation failure. Please refer to declaration.

- RSS-247 Clause 6.4 b):

The device must contain security features to protect against modification of software by unauthorized parties. Please refer to declaration.

- RSS-247 Clause 6.4 c):

1. The device for operation in the band 5150–5250MHz is only for indoor. And there has 2 Dipole Antennas, 1 PIFA Antenna and 1 PCB Antenna.

2. The device has 2 Dipole Antennas, 1 PIFA Antenna and 1 PCB Antenna for bands 5250-5350MHz and 5470-5725MHz.

3. The device has 2 Dipole Antennas, 1 PIFA Antenna and 1 PCB Antenna for band 5725-5850MHz.

4. Compliant with the e.i.r.p. requirement set forth in section 6.2.2.3.

The Result is complete.

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