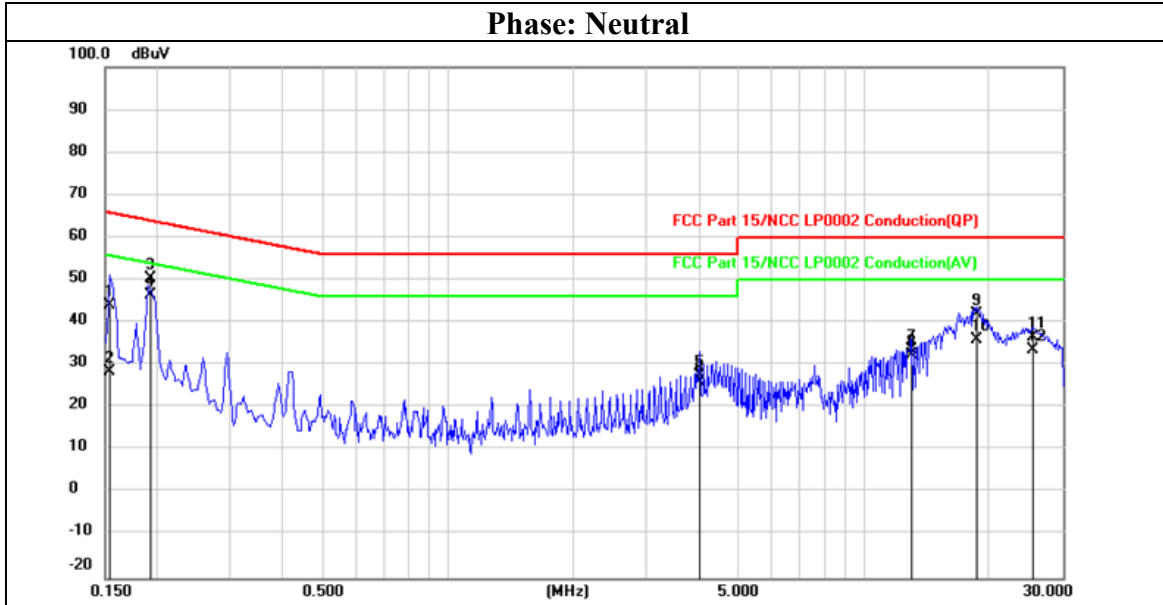


Mode	11ax160_TX6025	Channel	15
------	----------------	---------	----



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1532	34.14	9.95	44.09	65.82	-21.73	QP
2	0.1532	18.65	9.95	28.60	55.82	-27.22	AVG
3	0.1926	40.35	9.94	50.29	63.92	-13.63	QP
4	0.1926	36.48	9.94	46.42	53.92	-7.50	AVG
5	4.0222	17.57	10.08	27.65	56.00	-28.35	QP
6	4.0222	15.85	10.08	25.93	46.00	-20.07	AVG
7	13.0476	23.20	10.35	33.55	60.00	-26.45	QP
8	13.0476	22.10	10.35	32.45	50.00	-17.55	AVG
9	18.6384	31.32	10.49	41.81	60.00	-18.19	QP
10	18.6384	25.46	10.49	35.95	50.00	-14.05	AVG
11	25.4076	26.04	10.63	36.67	60.00	-23.33	QP
12	25.4076	22.84	10.63	33.47	50.00	-16.53	AVG

9.8. In-Band Emission (Mask) Measurement

Requirements

Test Item	Frequencies (MHz)	(X) dBc ^{*1}
Emission Mask	At 1 MHz outside of channel edge	20
	At one channel bandwidth from the channel center ^{*2}	28
	At one- and one-half times the channel bandwidth away from channel center ^{*3}	40
	More than one- and one-half times the channel bandwidth	40

^{*1} : The power spectral density must be suppressed by “x” dB

^{*2} : At frequencies between one megahertz outside an unlicensed device’s channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression,

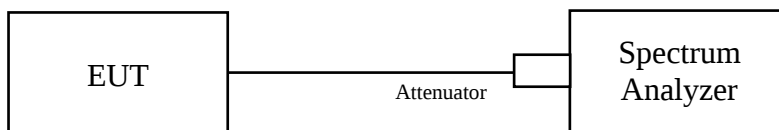
^{*3} : At frequencies between one and one- and one-half times an unlicensed device’s channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression.

Test procedure

Using method:

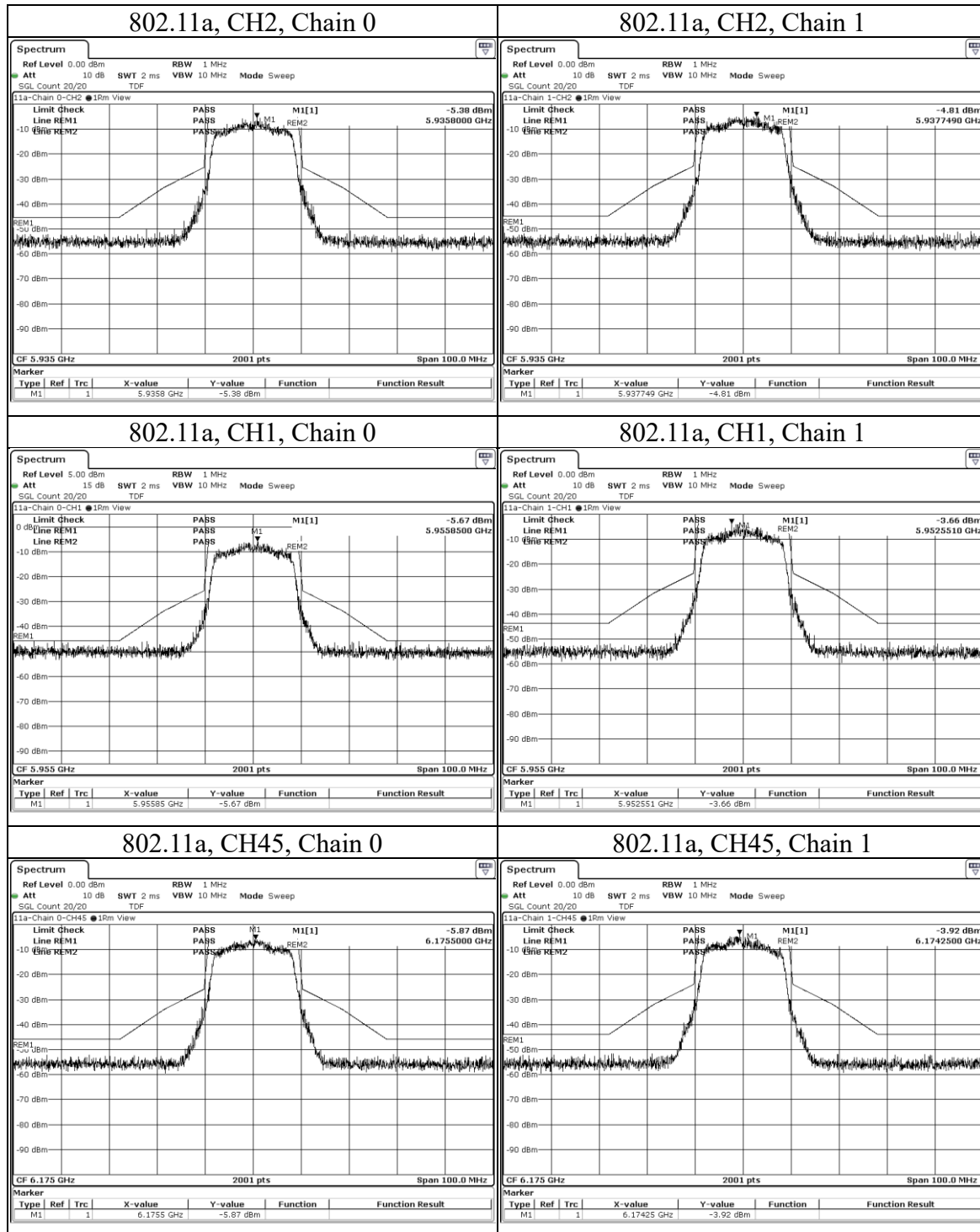
- a. Connect output of the antenna port to a spectrum analyzer and adjust appropriate attenuation.
- b. Measure the 26 dB EBW using the test procedure 12.4.1 of ANSI C63.10-2013. (Determine the channel edge.)
- c. Measure the power spectral density (for emissions mask reference) using the following procedure:
 - a) Set the span to encompass the entire 26 dB EBW of the signal.
 - b) Set RBW = same RBW used for 26 dB EBW measurement.
 - c) Set $VBW \geq 3 \times RBW$
 - d) Number of points in sweep $\geq [2 \times \text{span} / RBW]$.
 - e) Sweep time = auto.
 - f) Detector = RMS (i.e., power averaging)
 - g) Trace average at least 100 traces in power averaging (rms) mode.
 - h) Use the peak search function on the instrument to find the peak of the spectrum.
- d. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:
 - a) Suppressed by 20 dB at 1 MHz outside of the channel edge. (The channel edge is defined as the 26-dB point on either side of the carrier center frequency.)
 - b) Suppressed by 28 dB at one channel bandwidth from the channel center.
 - c) Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.
- e. Adjust the span to encompass the entire mask as necessary and clear trace.
- f. Trace average at least 100 traces in power averaging (rms) mode.
- g. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask

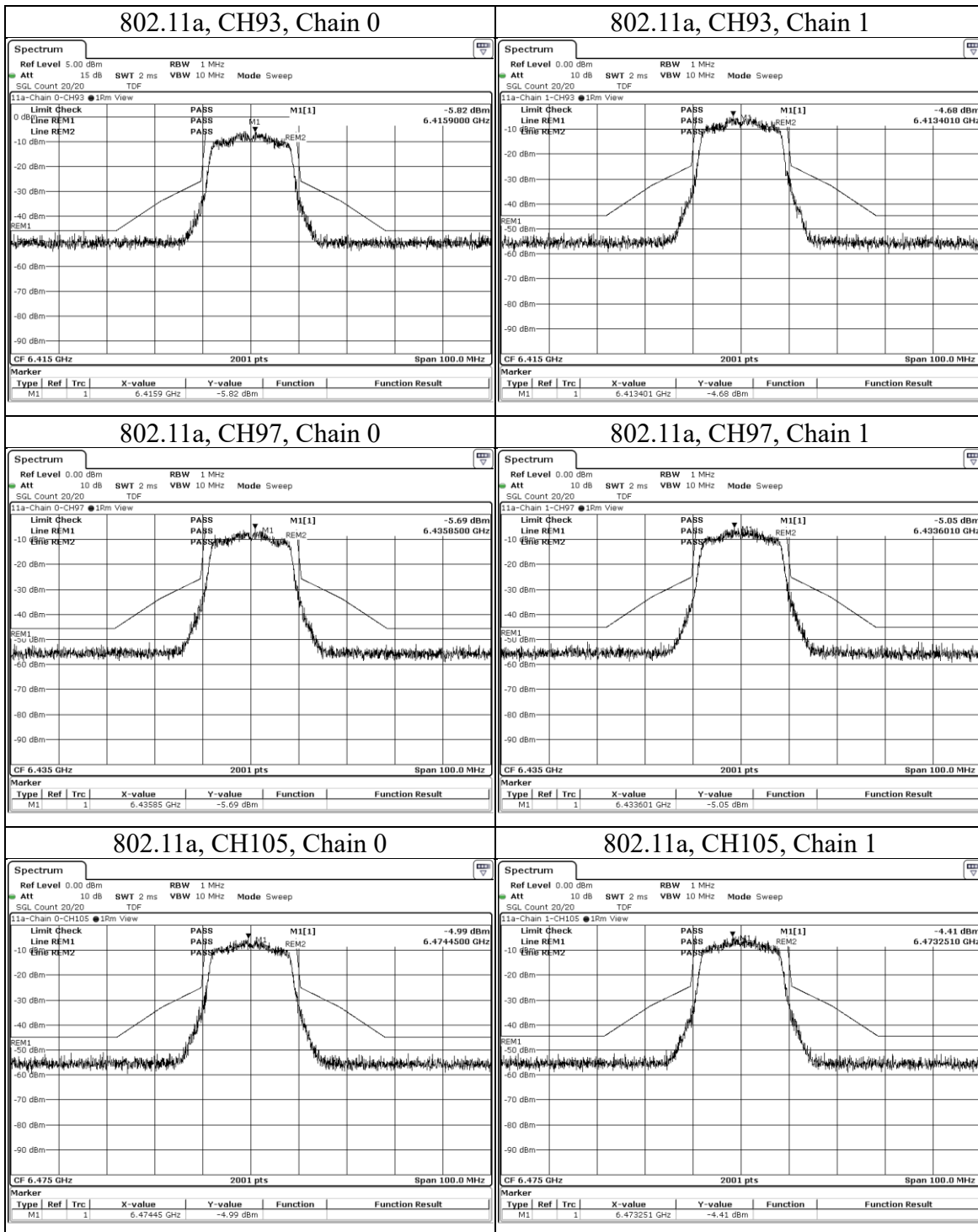
Test Setup

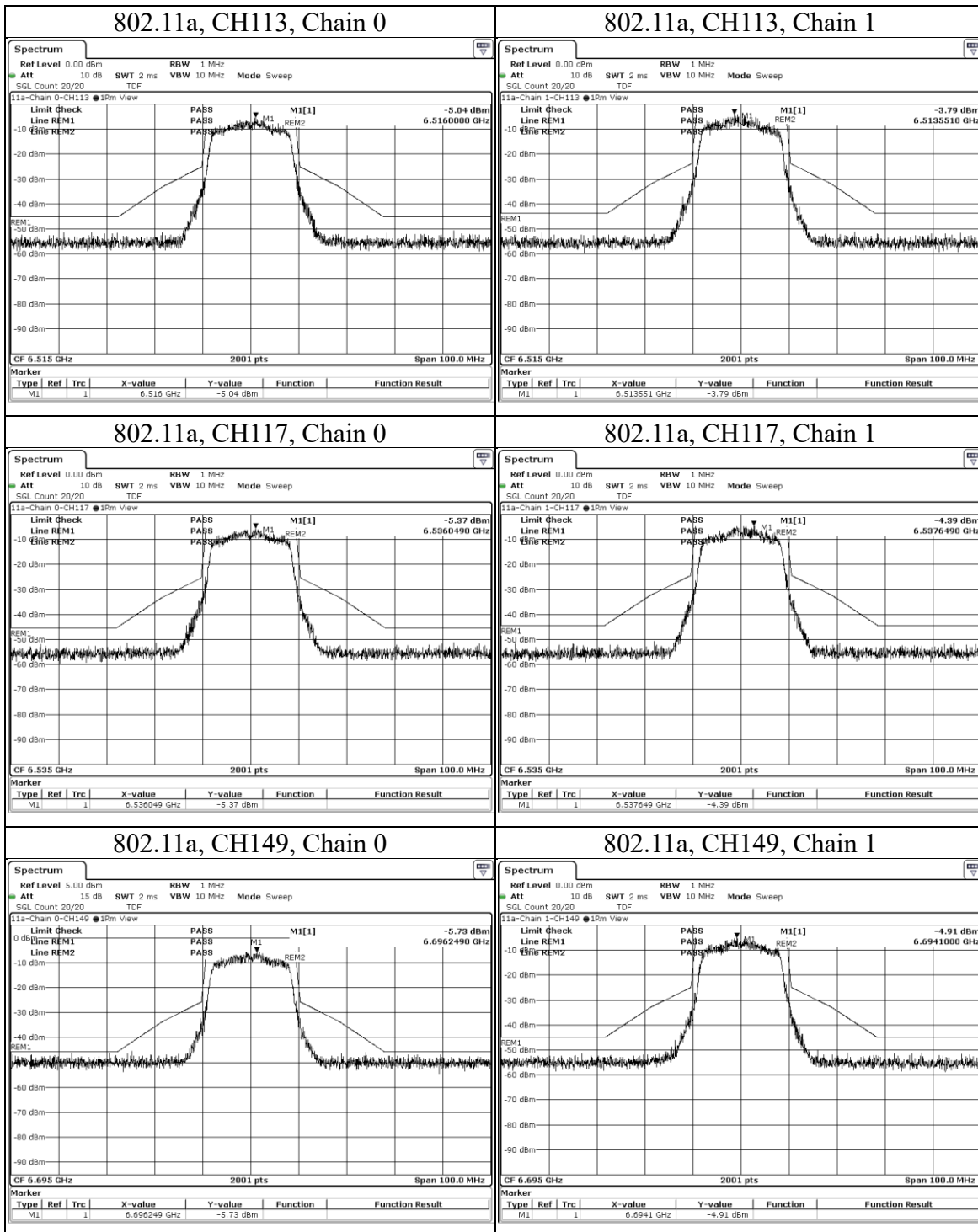


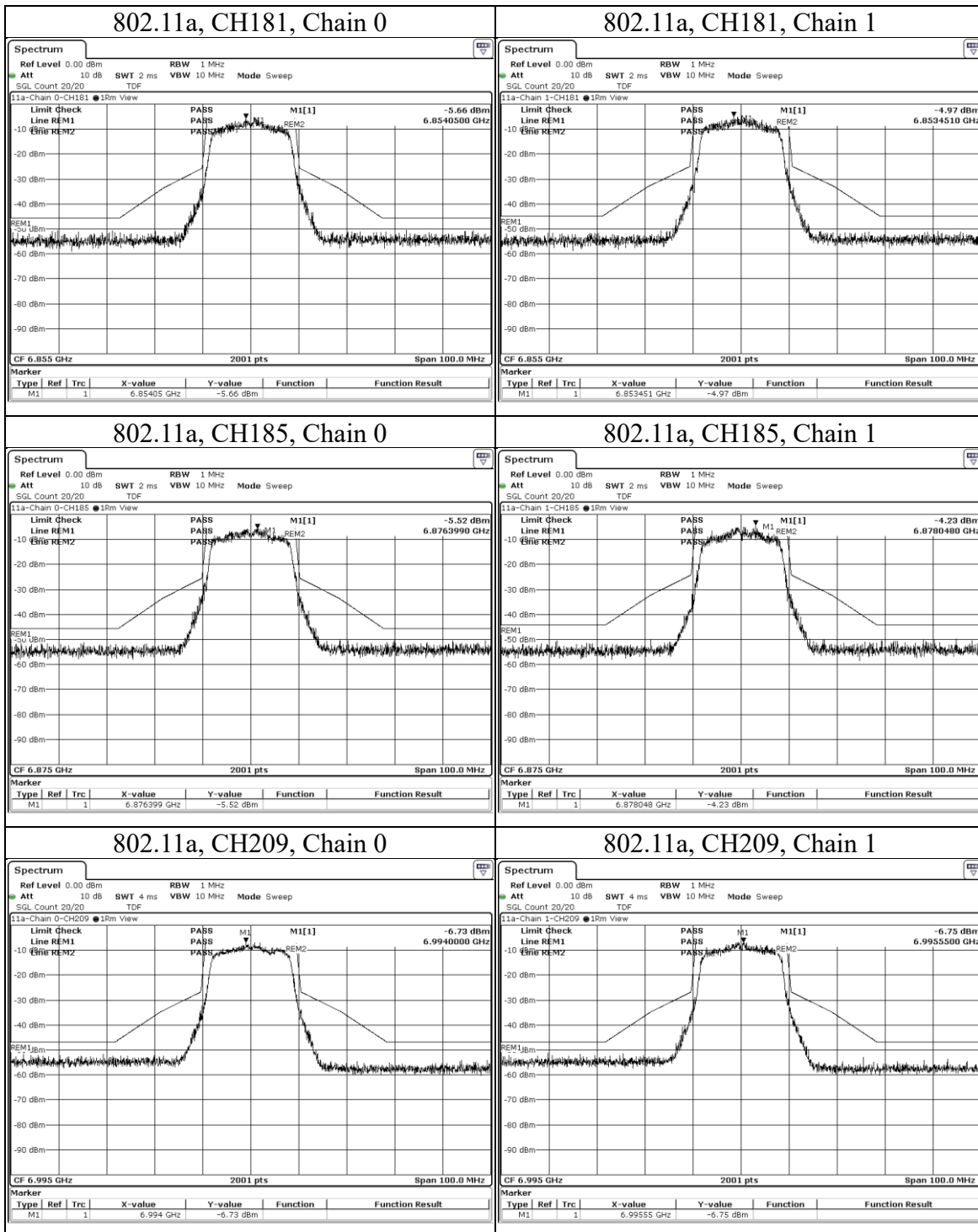
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

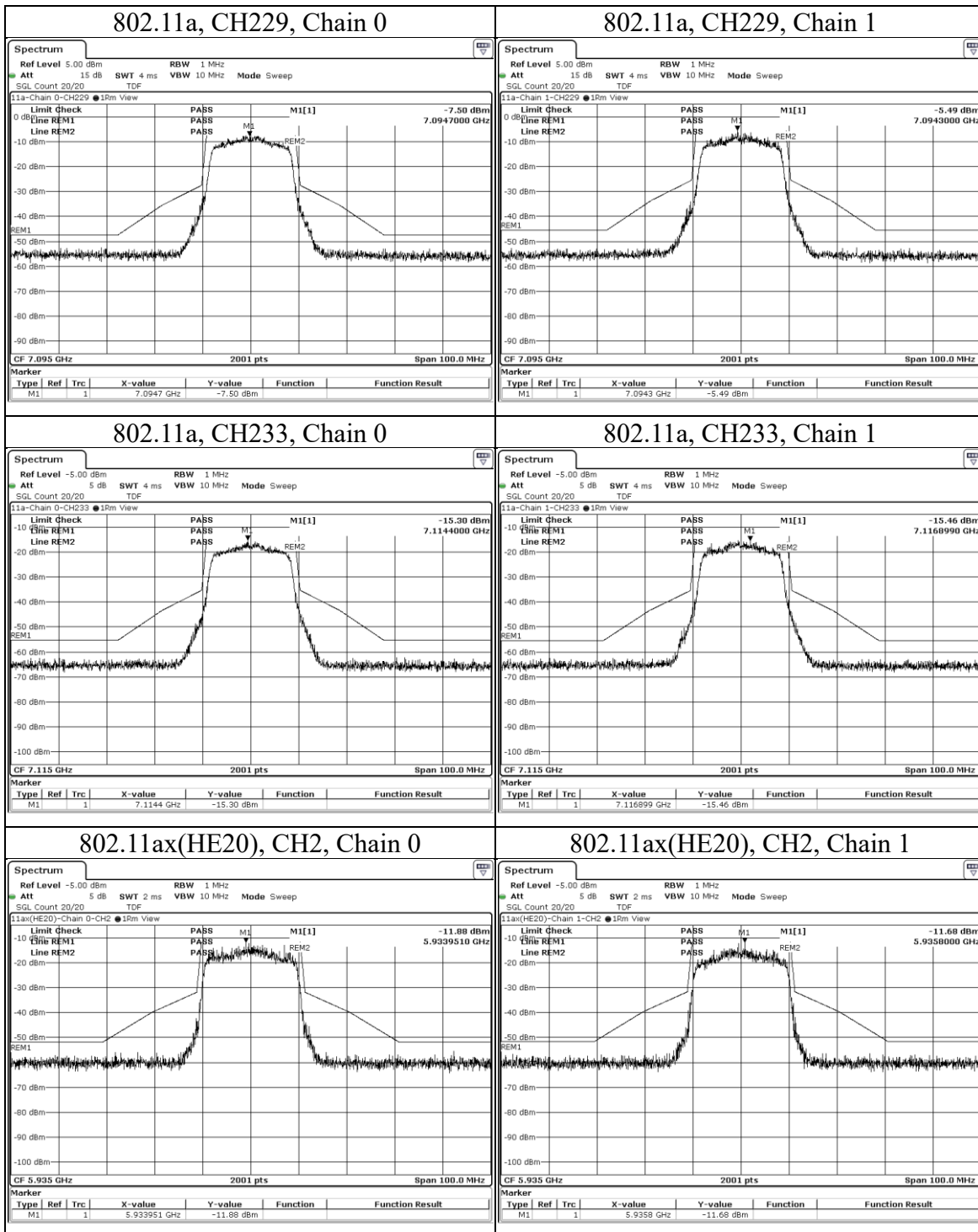
Test Data

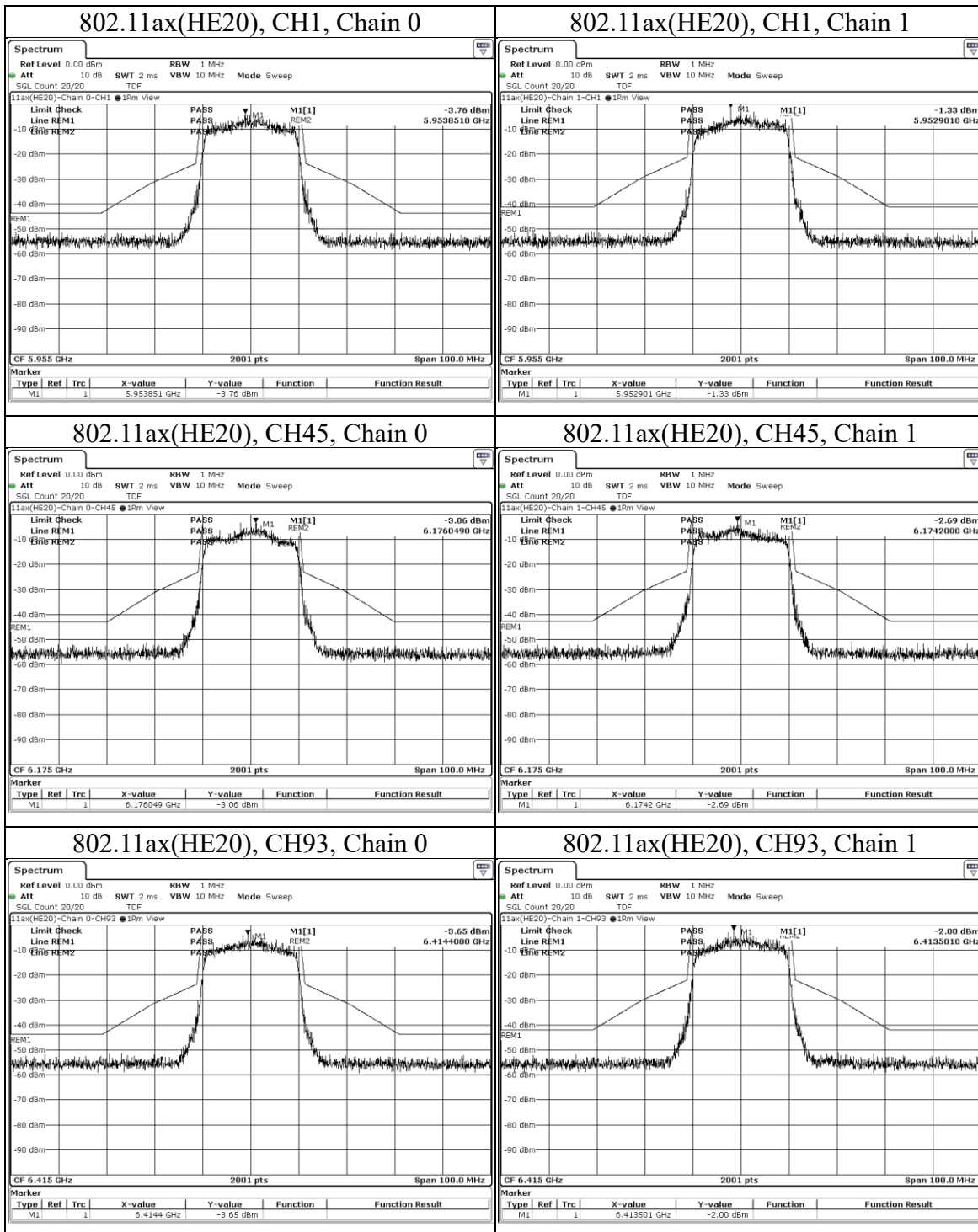


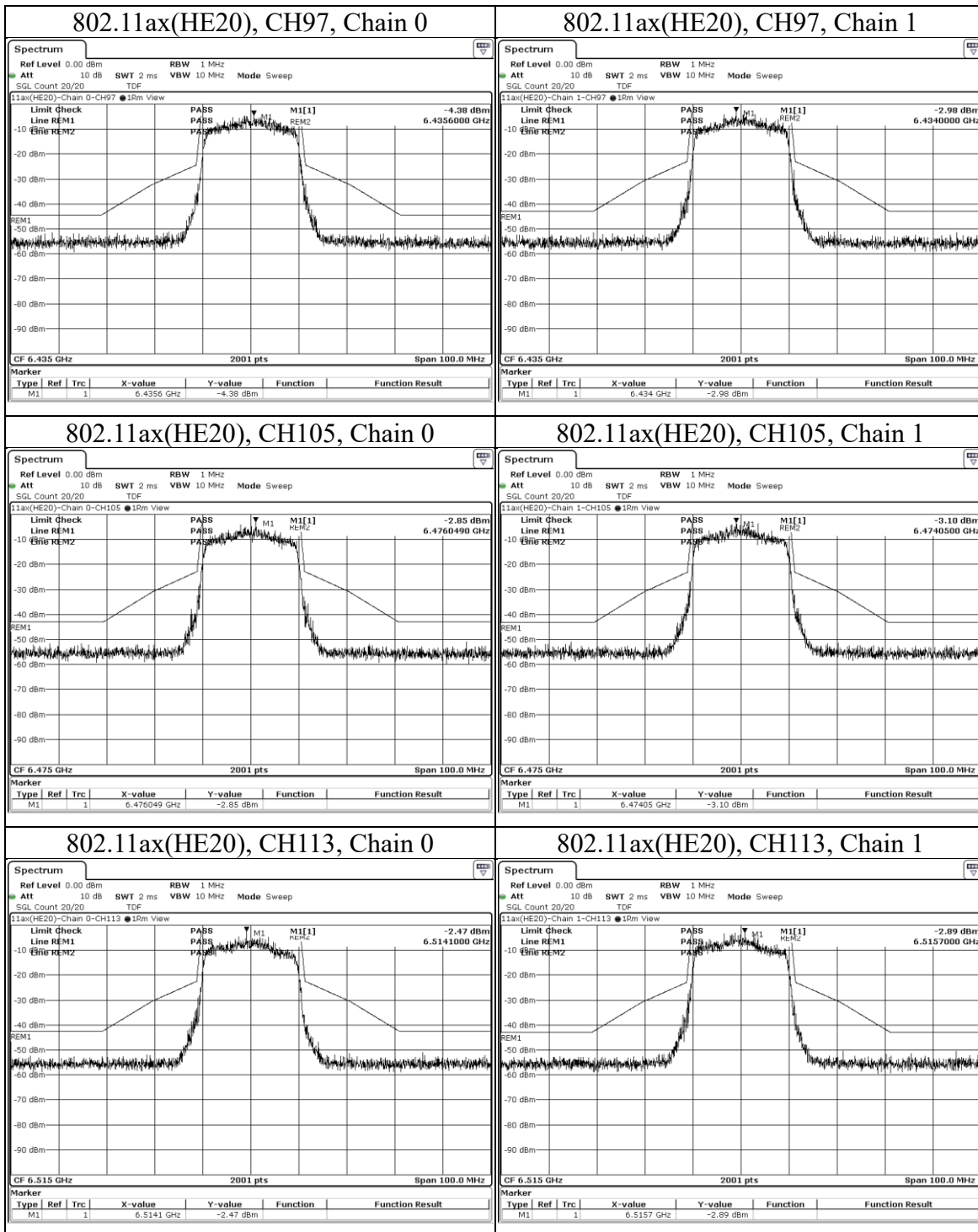


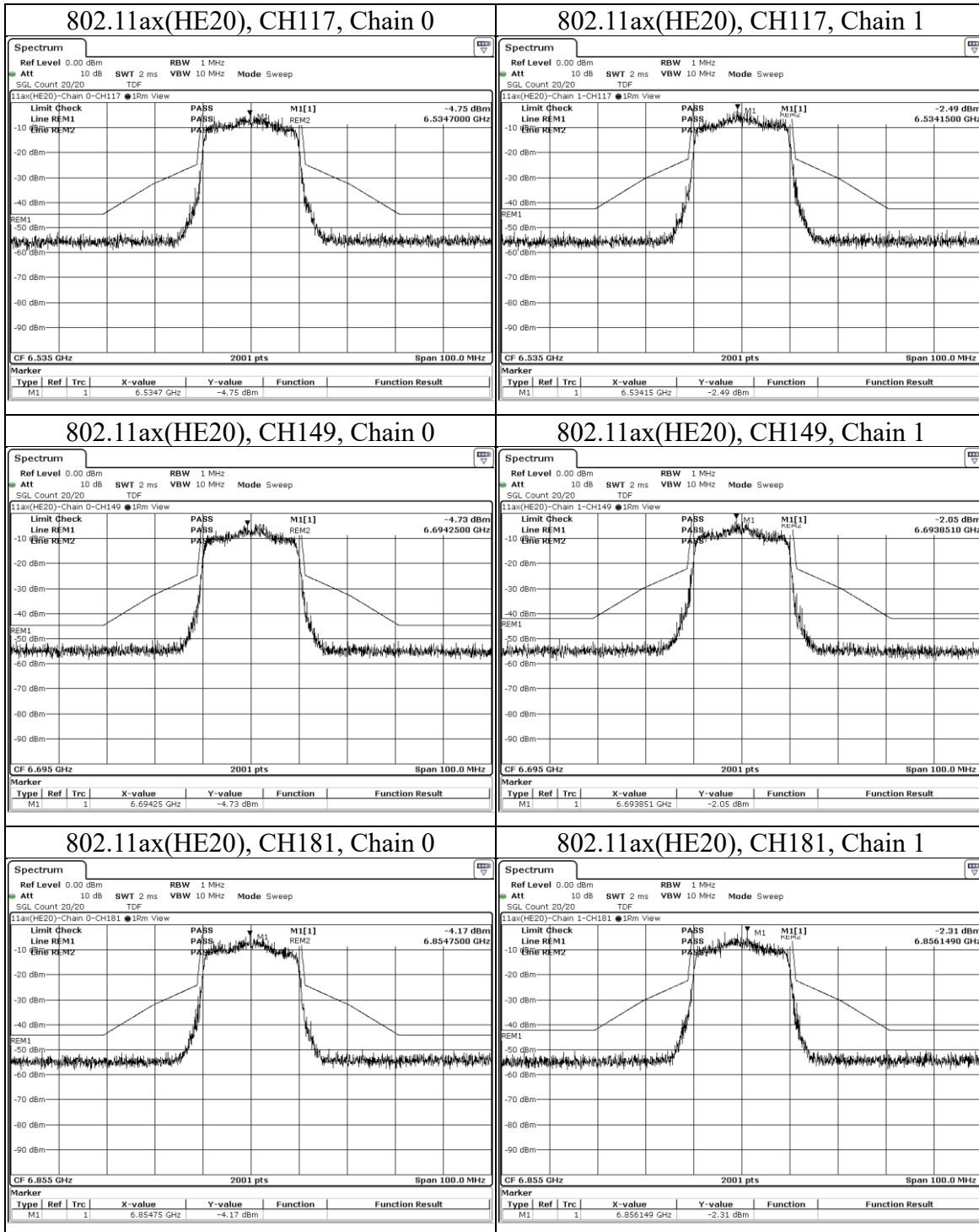


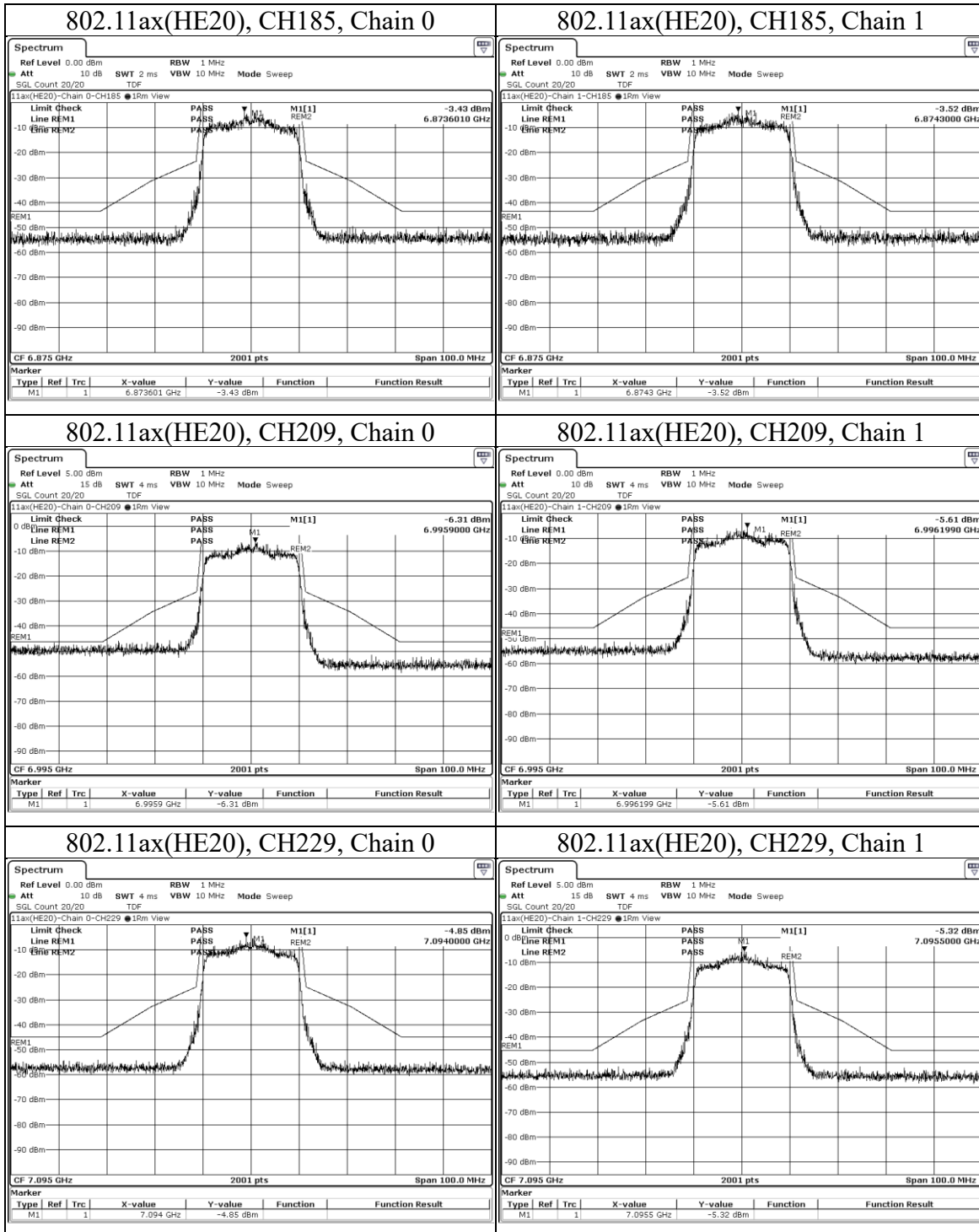


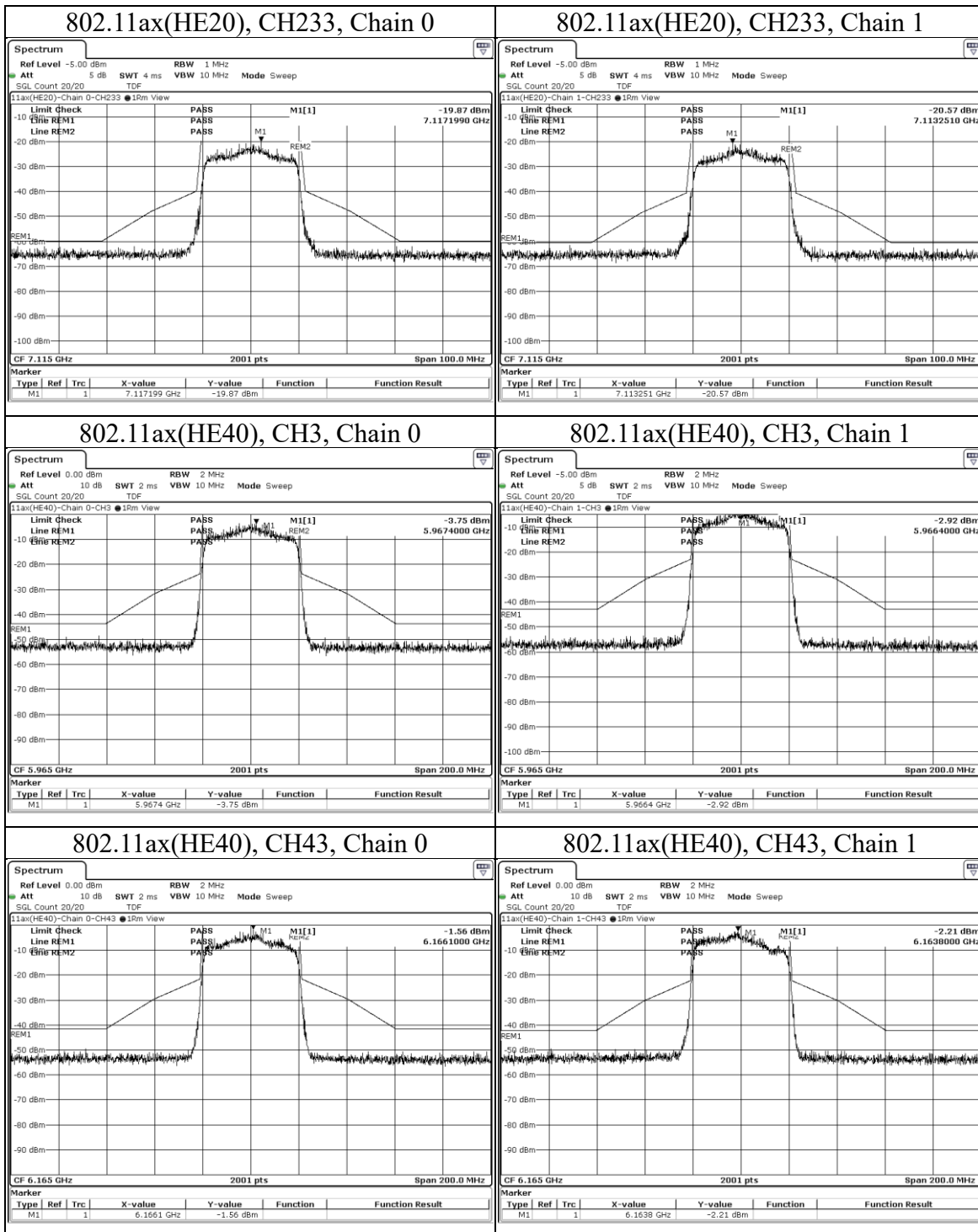


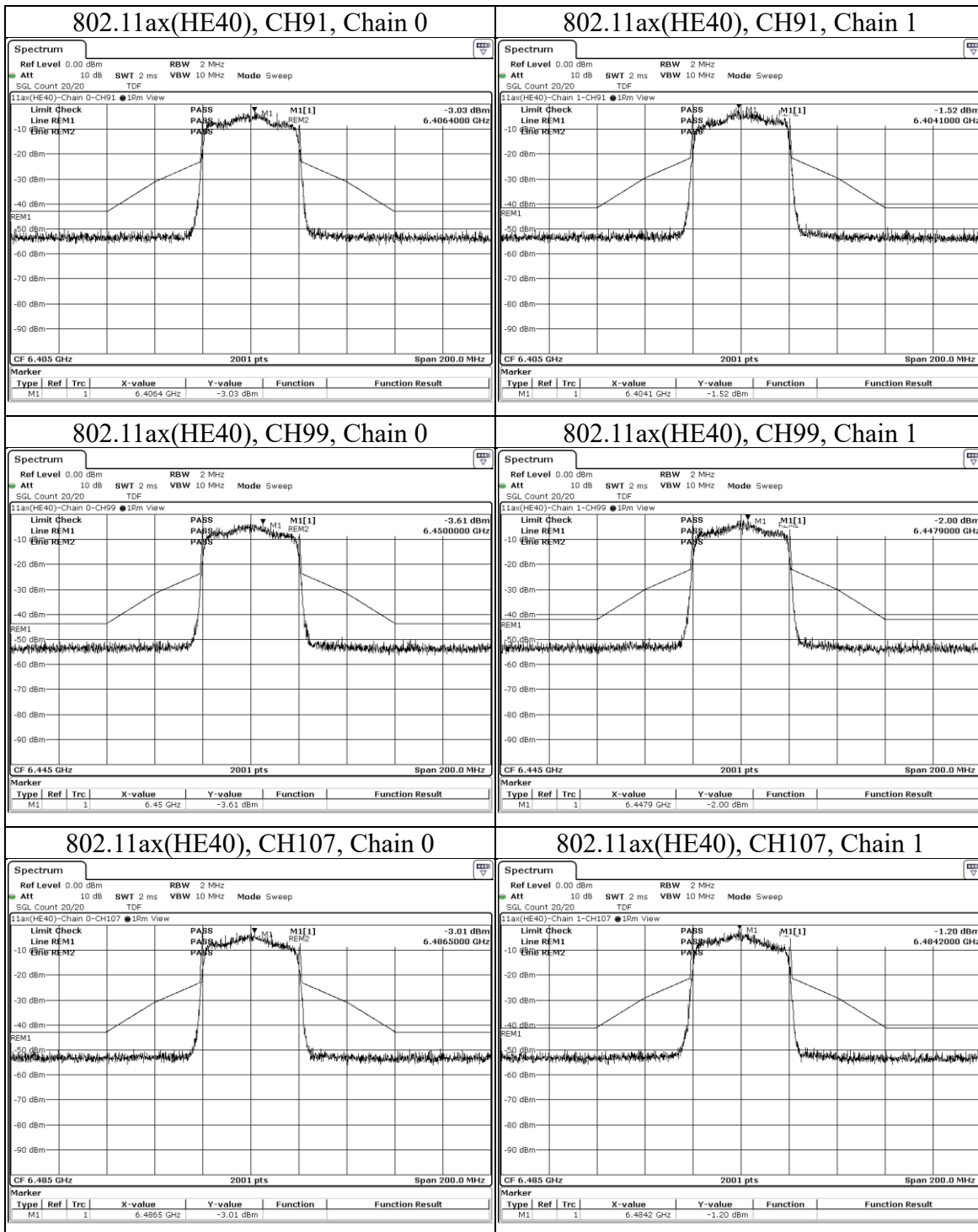


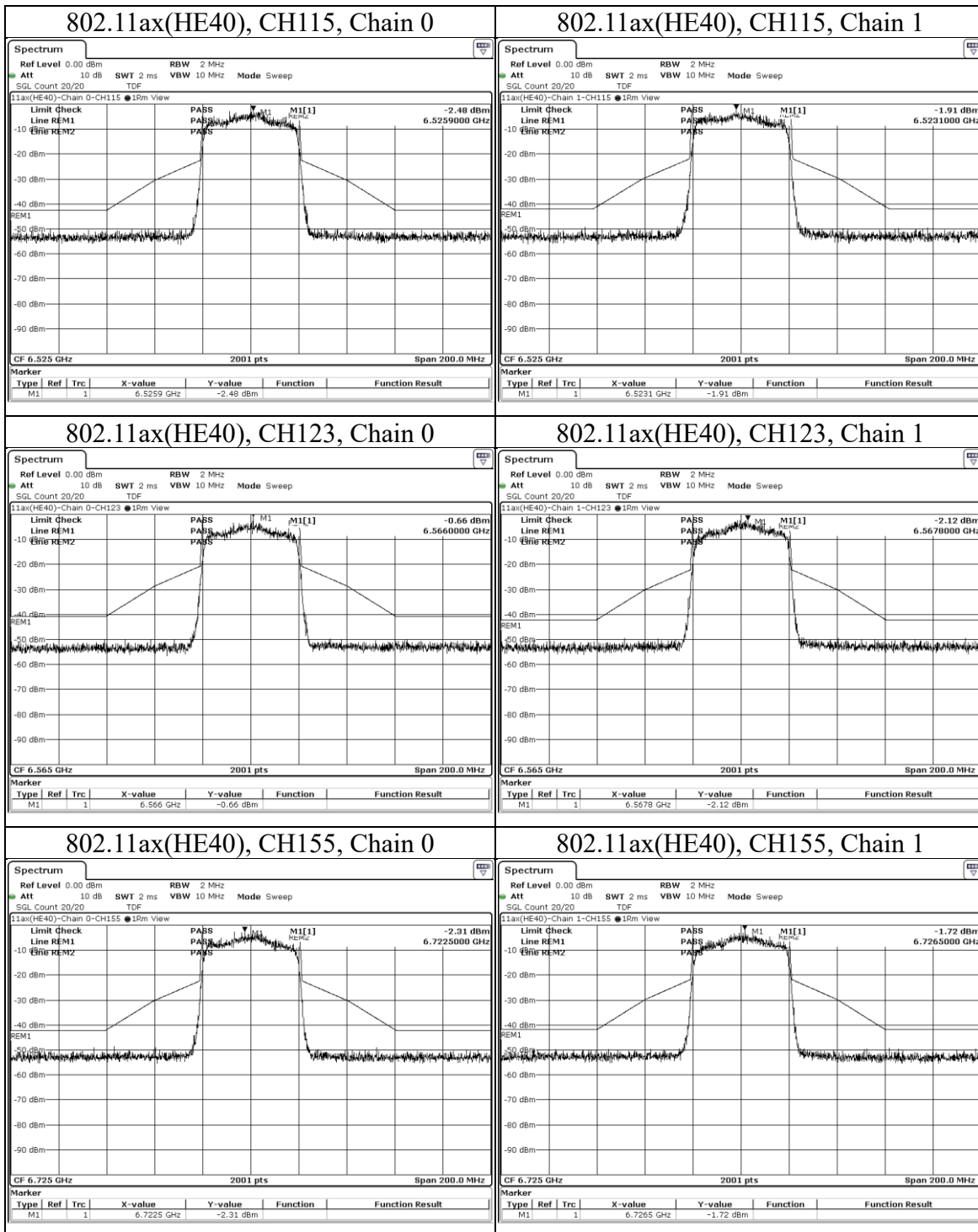


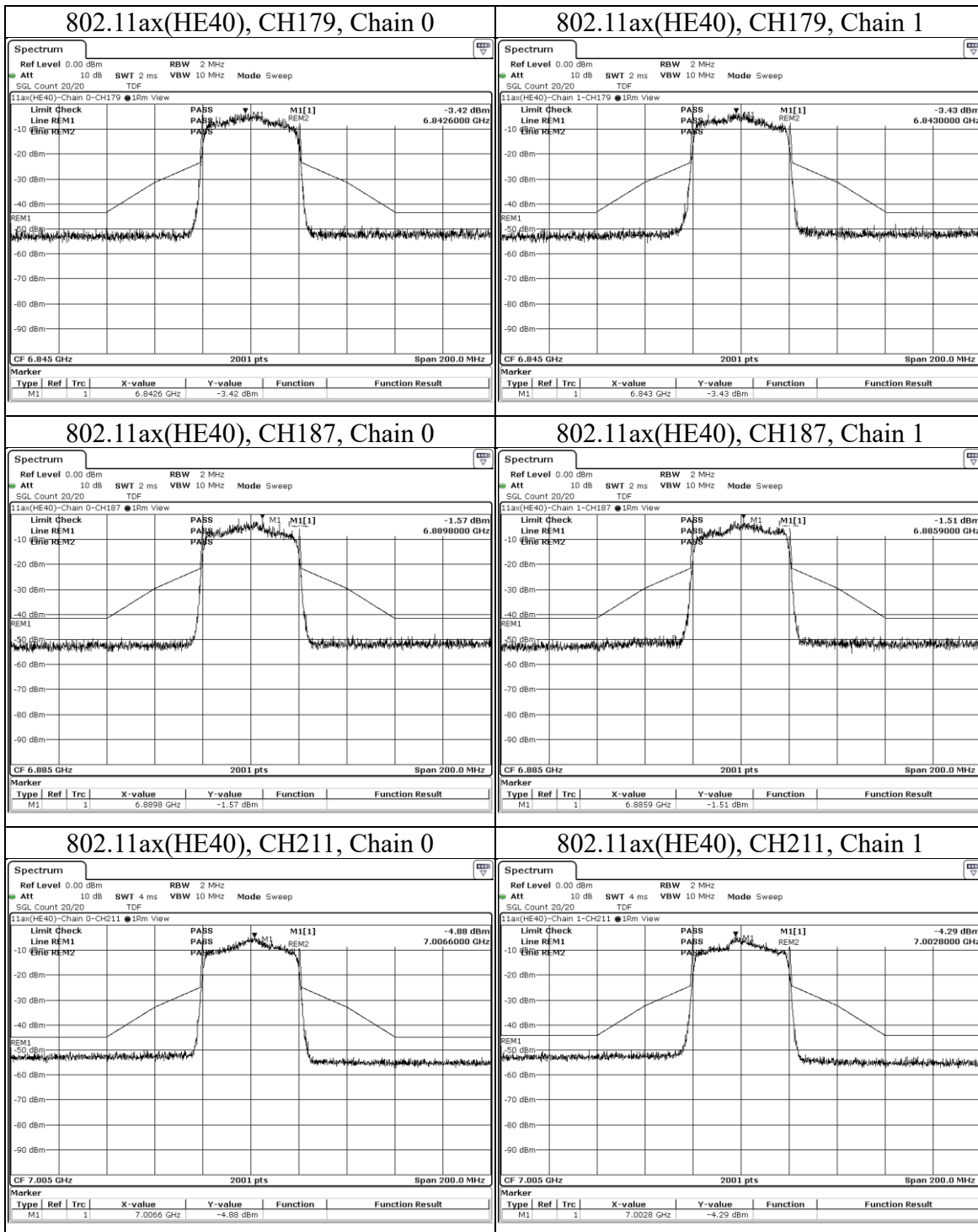


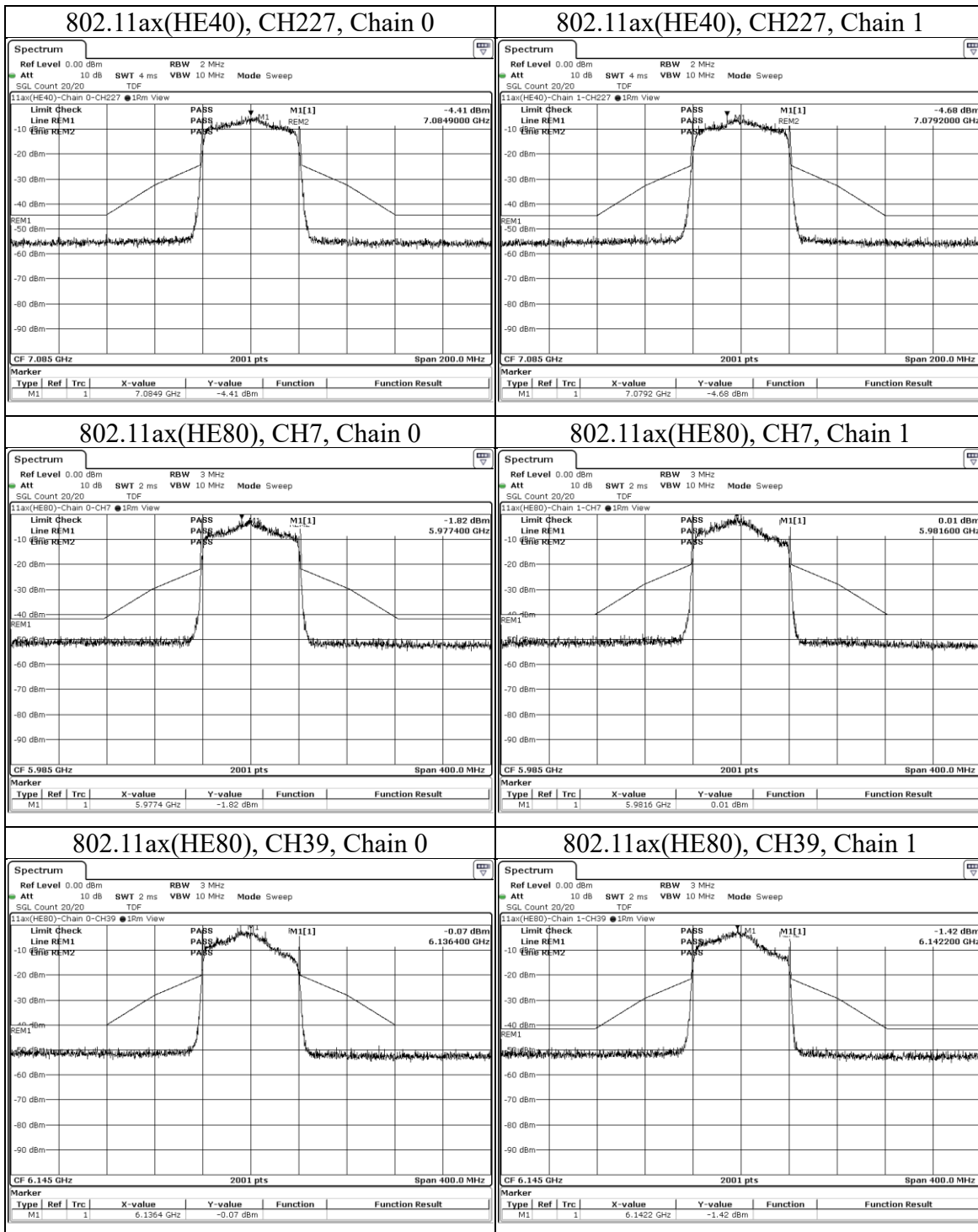


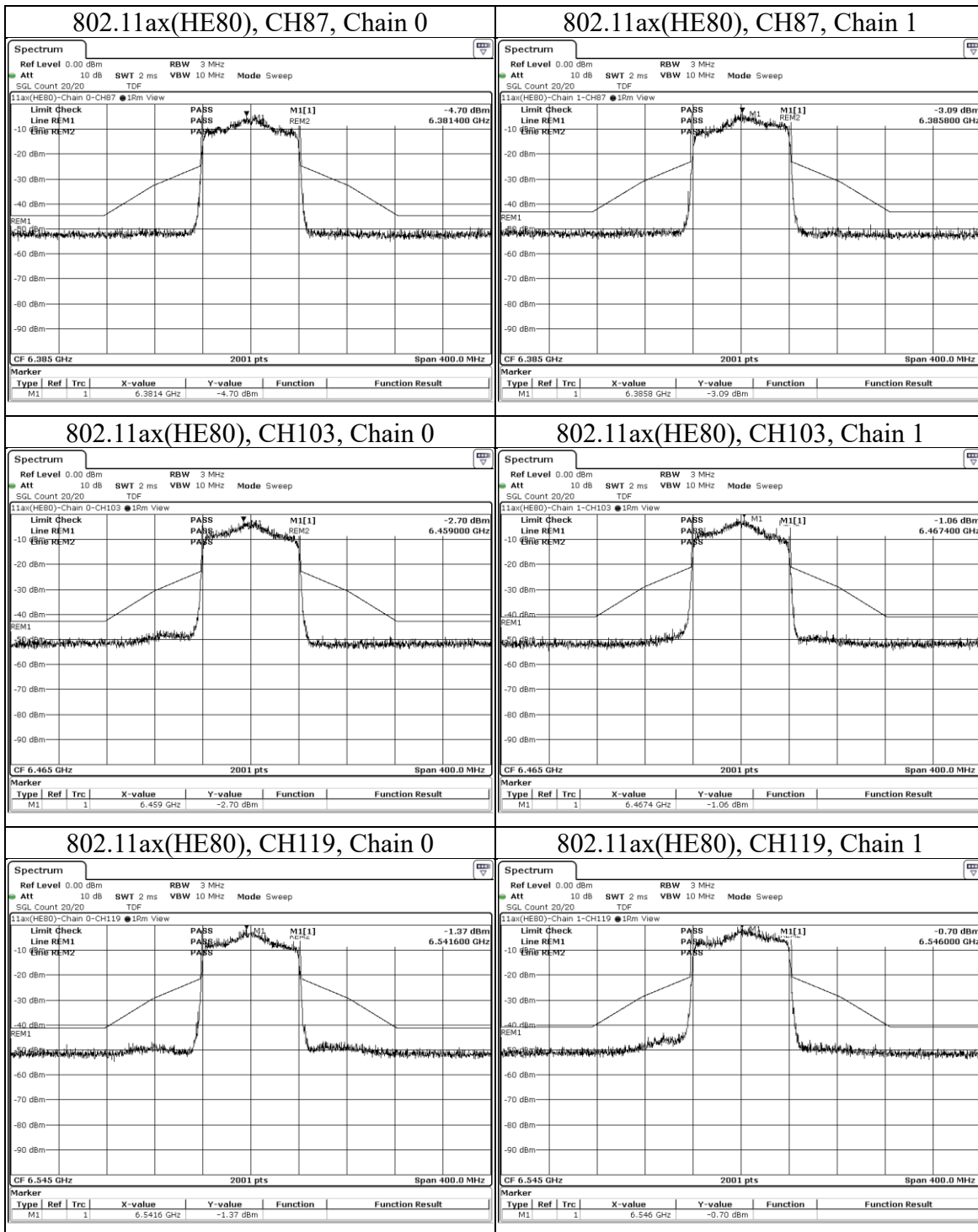


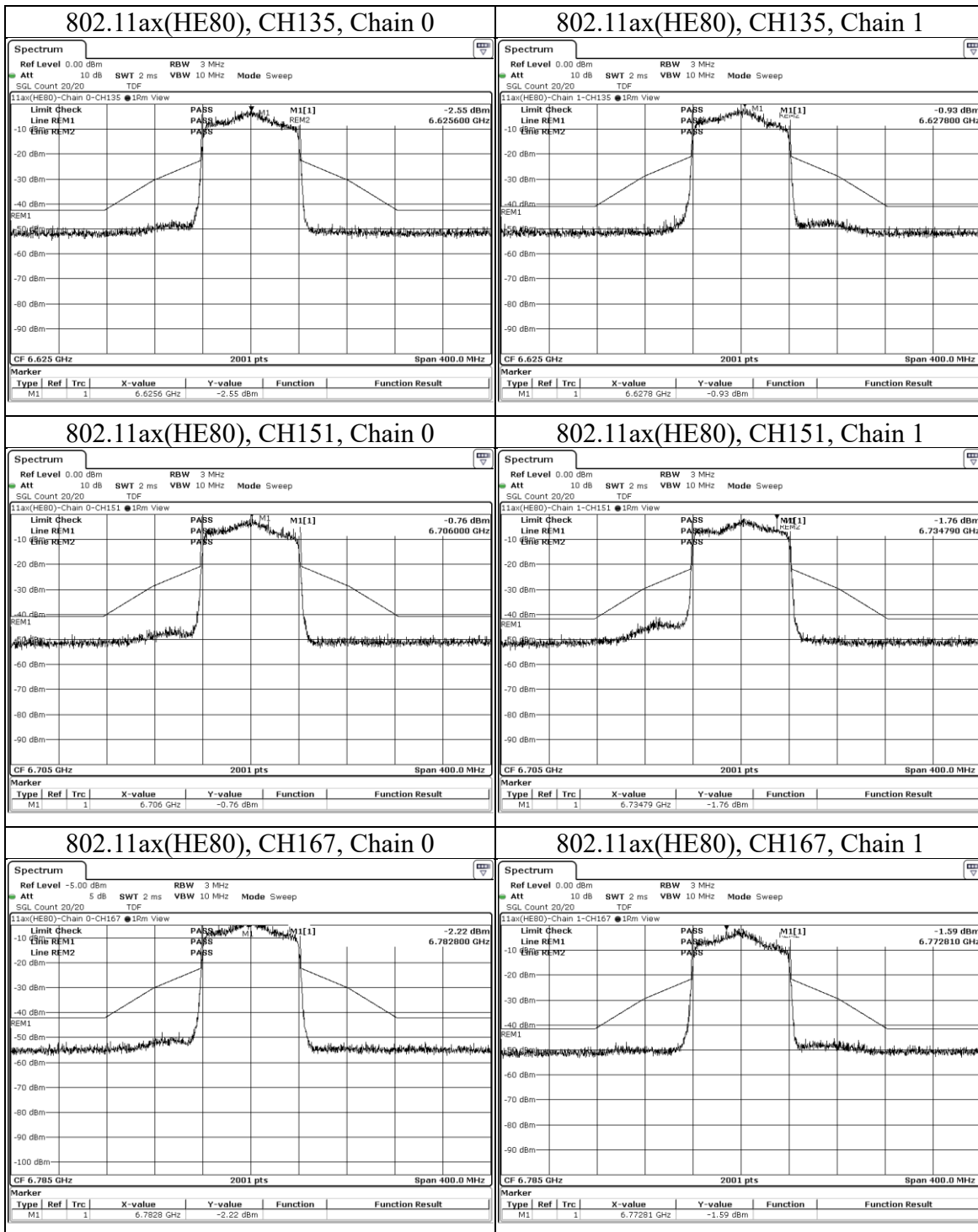


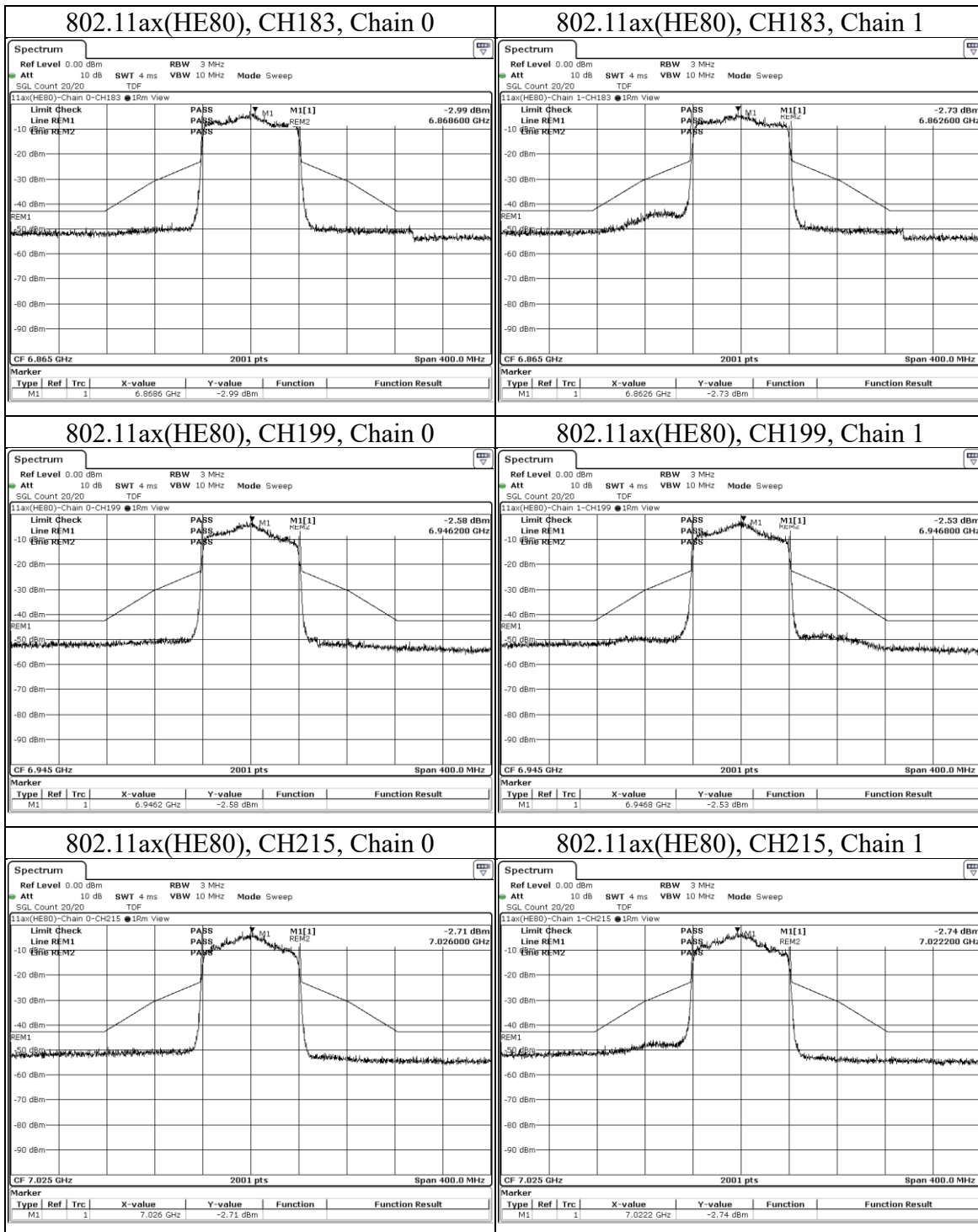


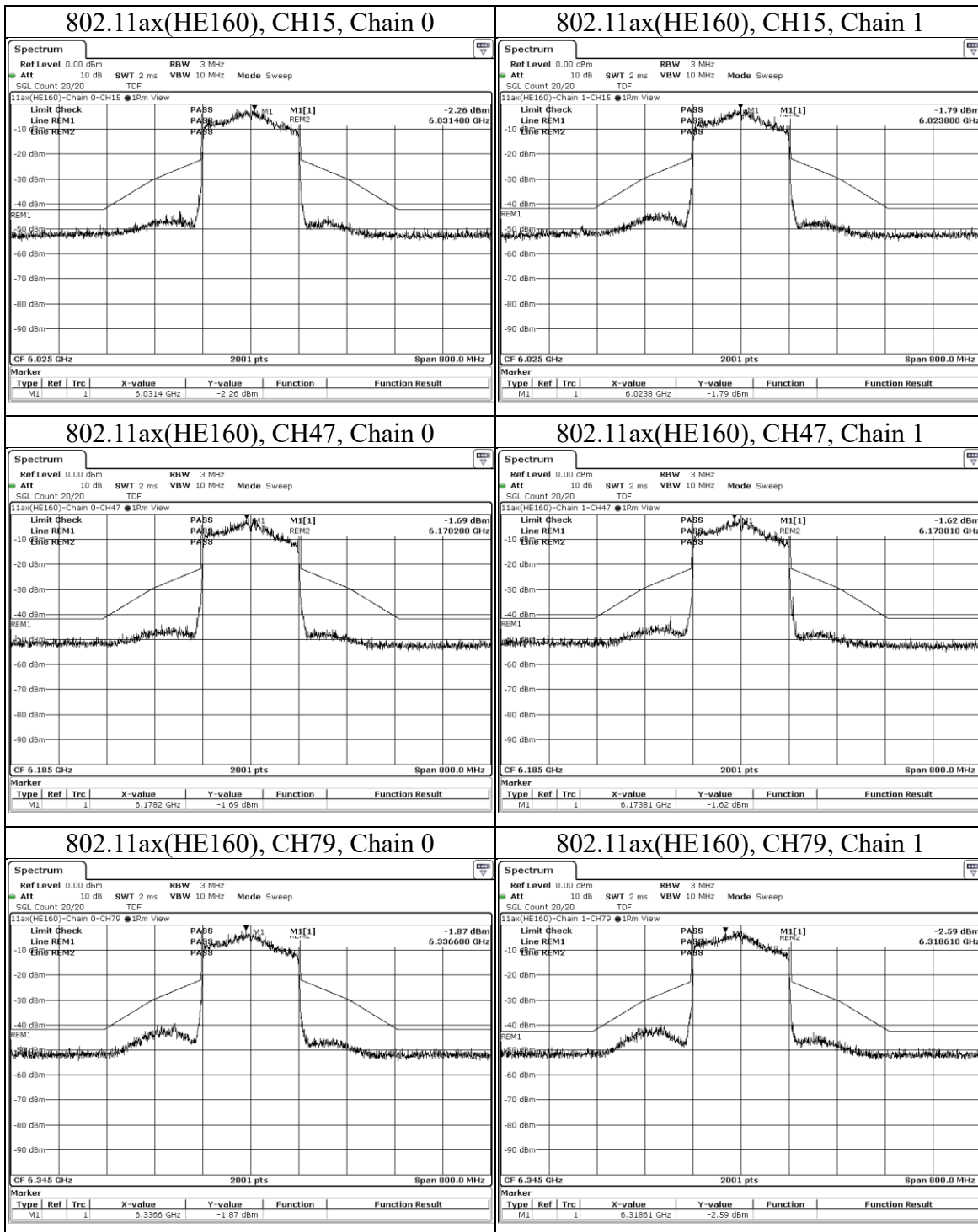


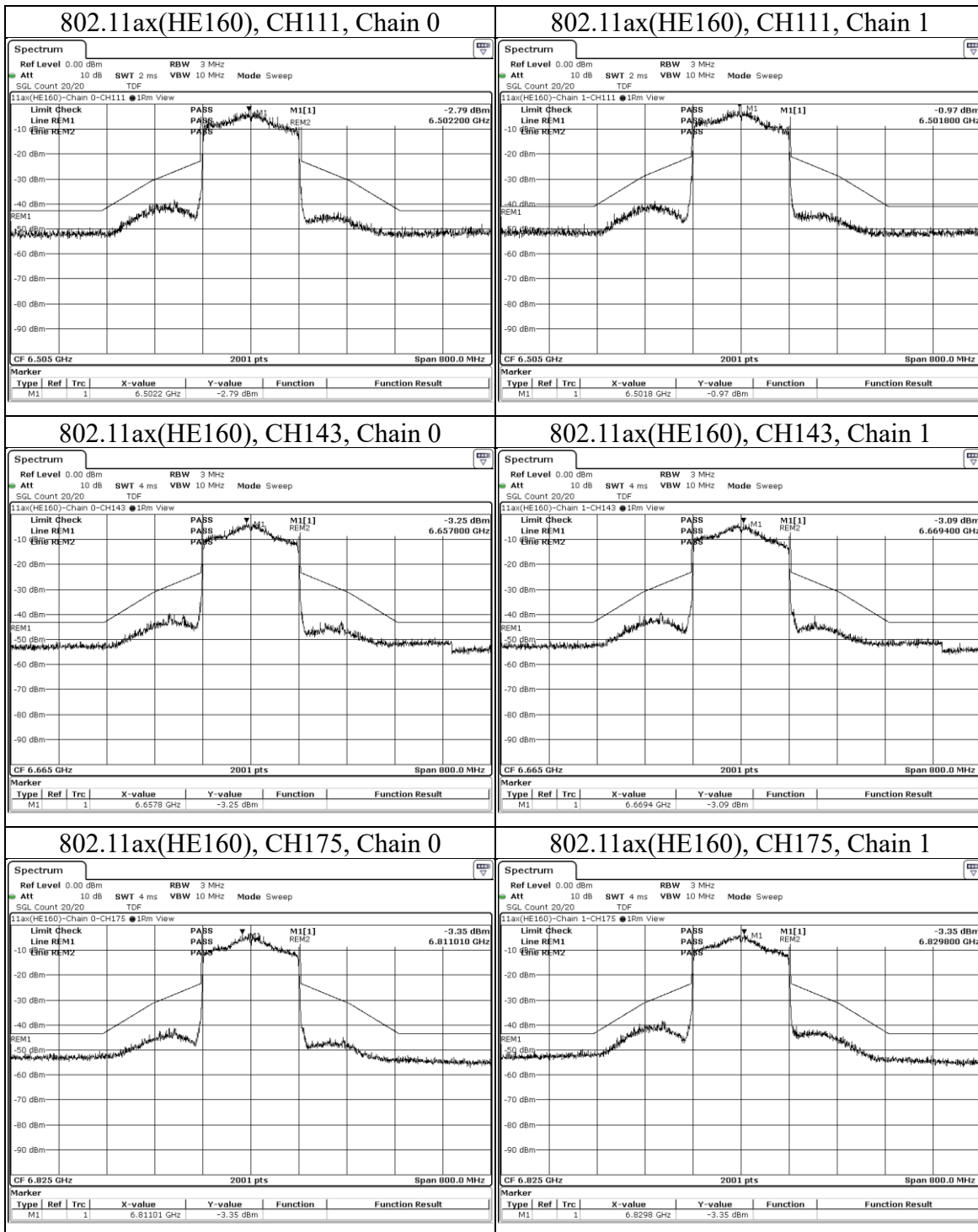


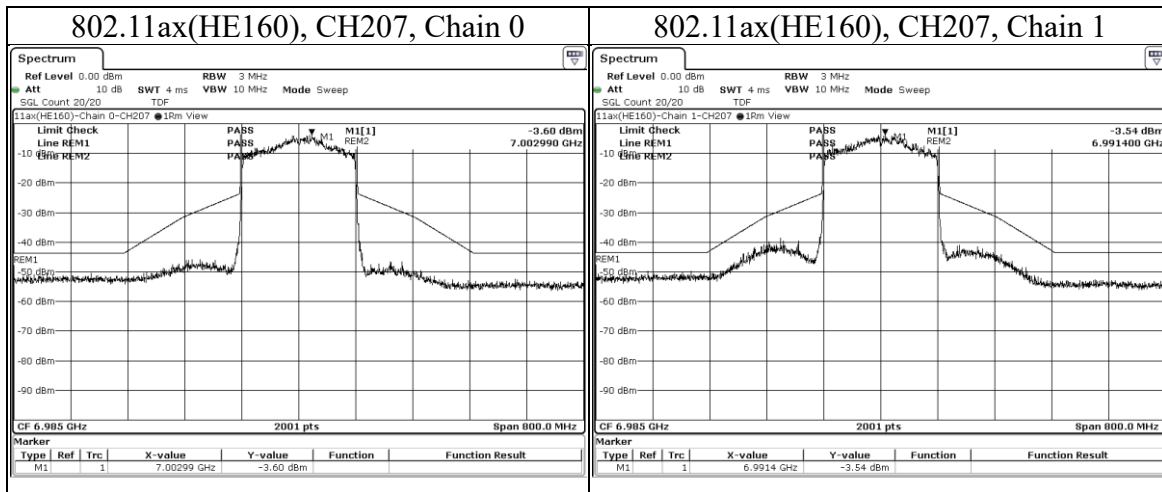












9.9. Contention Based Protocol Measurement

Requirements

Unlicensed indoor low-power devices must detect co-channel radio frequency power that is at least -62 dBm (The threshold is referenced to a 0 dBi antenna gain.) or lower. Additionally, indoor low-power devices must detect co-channel energy with 90% or greater certainty.

Test procedure

- Set the EUT to transmit with a constant duty cycle and relative operating parameters which including power level, operating frequency, modulation and bandwidth.
- Set the signal analyzer center frequency to the nominal EUT channel center frequency. The span range of the signal analyzer shall be between two times and five times the OBW of the EUT. Trigger out connect the output port of the EUT to signal analyzer 2. Ensure that the attenuator 2 provides enough attenuation to not overload the signal analyzer 2 receiver.
- Monitoring the signal analyzer 2, verify the EUT is operating and transmitting with the parameters.
- Determine number of times detection threshold test as following table:

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Same as EUT transmission
$BW_{Inc} < BW_{EUT} \leq 2 * BW_{Inc}$	Once	Contained within BW_{EUT}
$2 * BW_{Inc} < BW_{EUT} \leq 4 * BW_{Inc}$	Twice (Incumbent transmission is contained within BW_{EUT})	Closely to the lower edge and upper edge of the EUT Channel
$BW_{EUT} > 4 * BW_{Inc}$	Three times	Closely to the lower edge, in the middle and upper edge of the EUT Channel

- Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use step c table to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
- Set the AWGN signal power to an extremely low level (more than 20 dB below the -62 dBm threshold). Connect the AWGN signal source, via a 3-dB splitter, to the signal analyzer 1 and the EUT.
- Transmit the AWGN signal (RF ON) and verify its characteristics on the signal analyzer 1.
- Monitor the signal analyzer 2 to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
- (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
- Refer to step c table to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step d, choose a different center frequency for the AWGN signal and repeat the process.

Underwriters Laboratories Taiwan Co., Ltd.

Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: Form-ULID-004814 (17-EM-F0980) V1.1