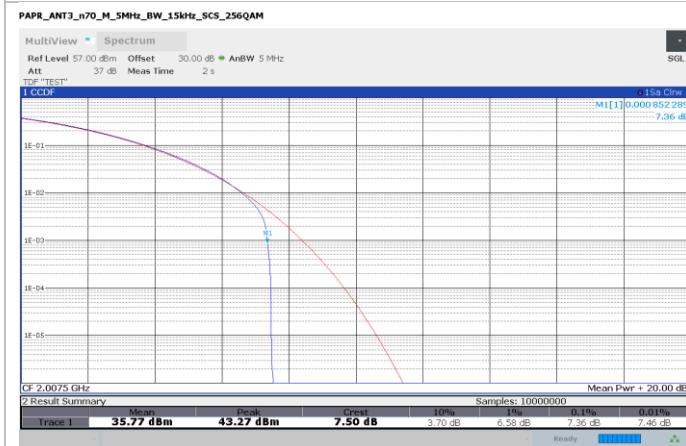
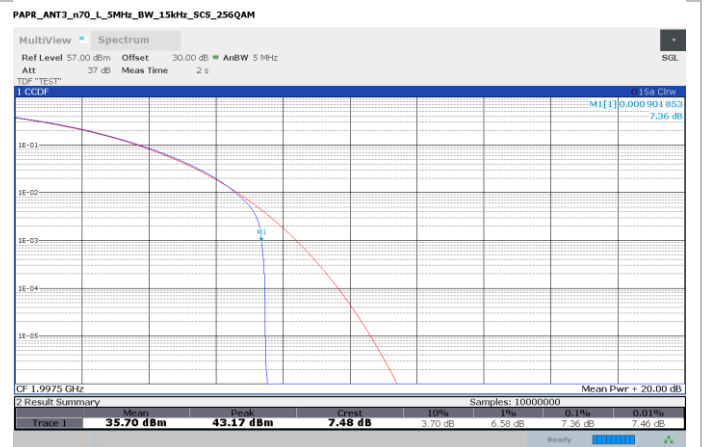
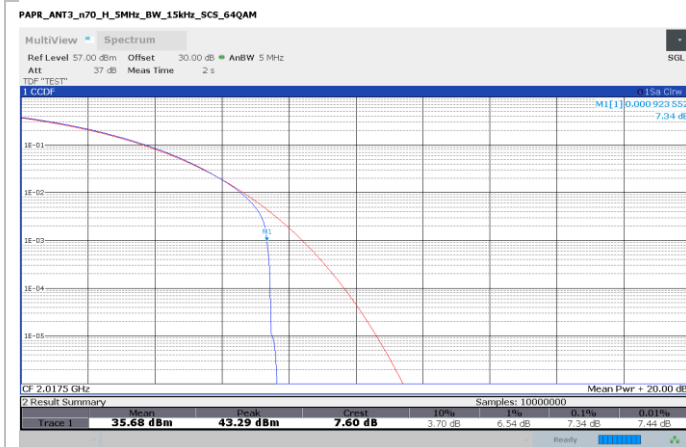
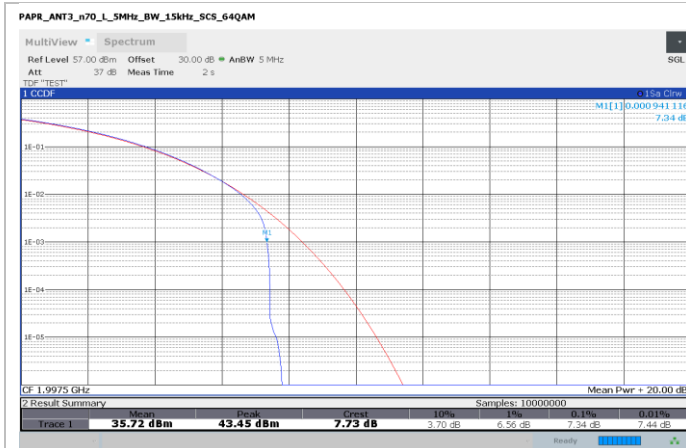
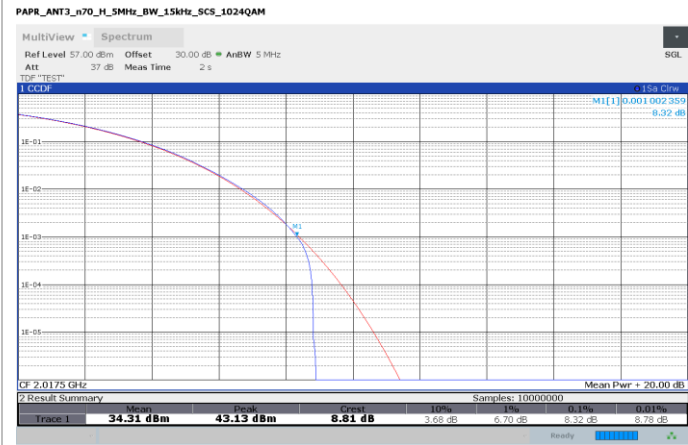
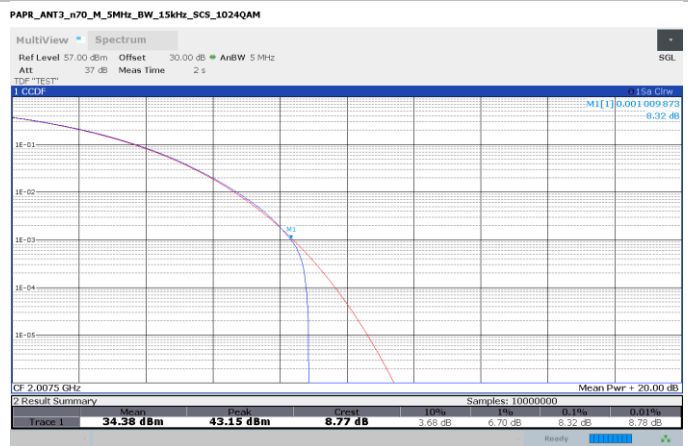


Section 8
Test name
Specification

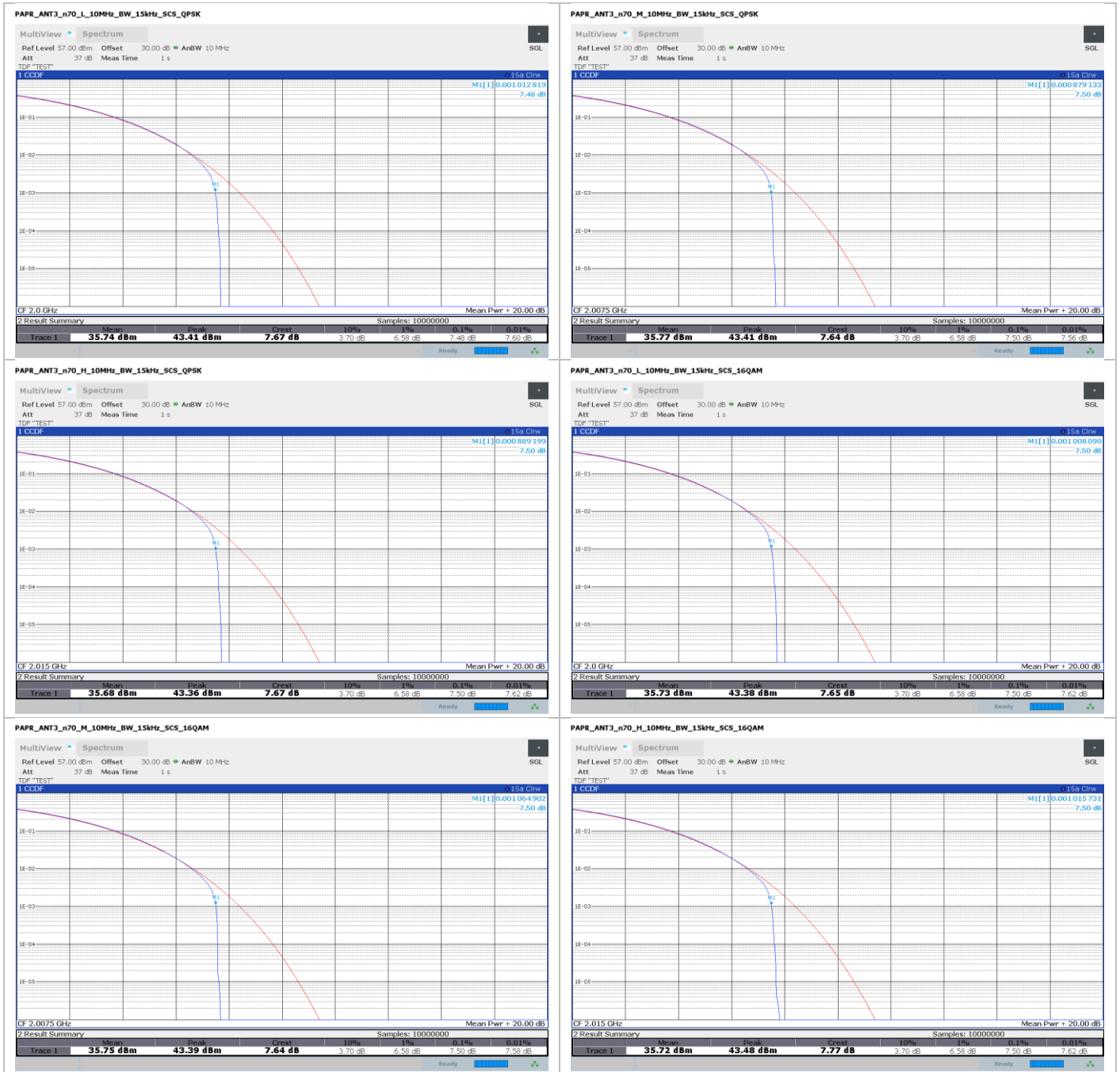
Testing
FCC 27.50(d)(5) Peak to Average Power Ratio
FCC Part 27





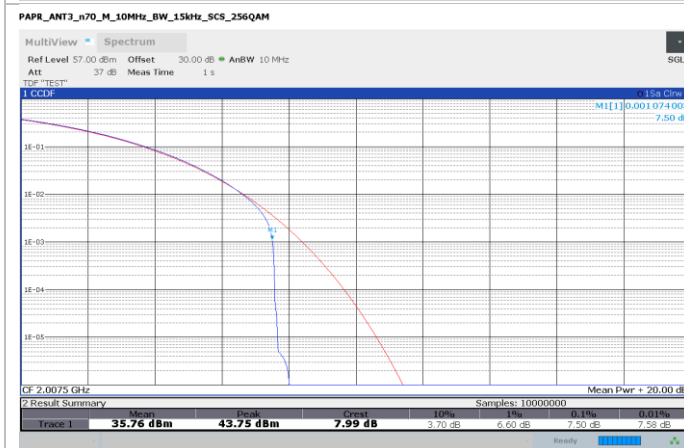
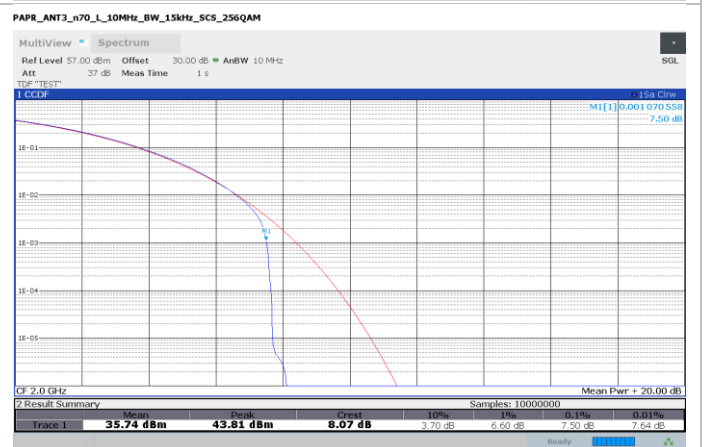
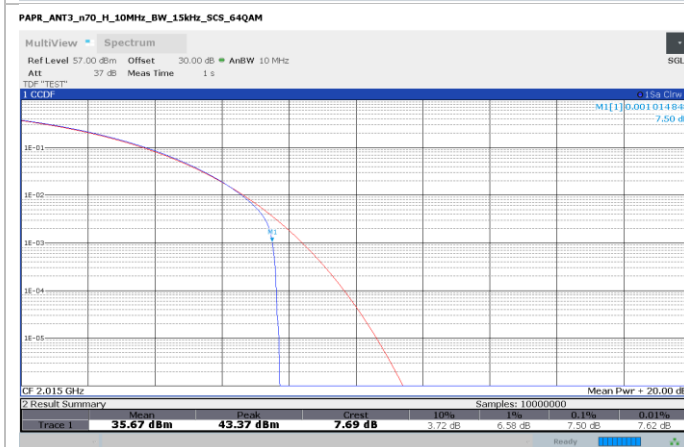
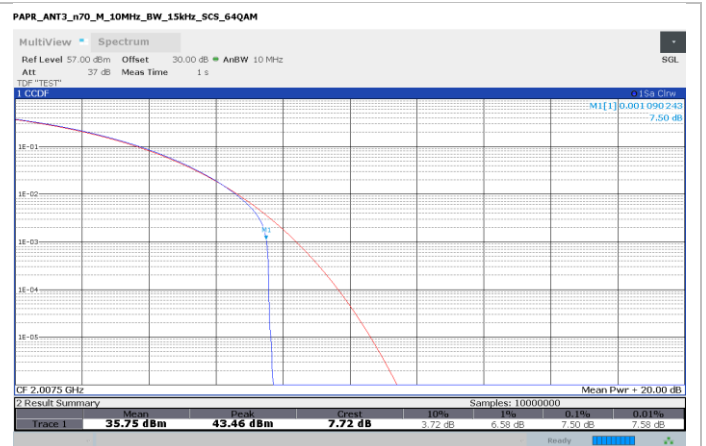
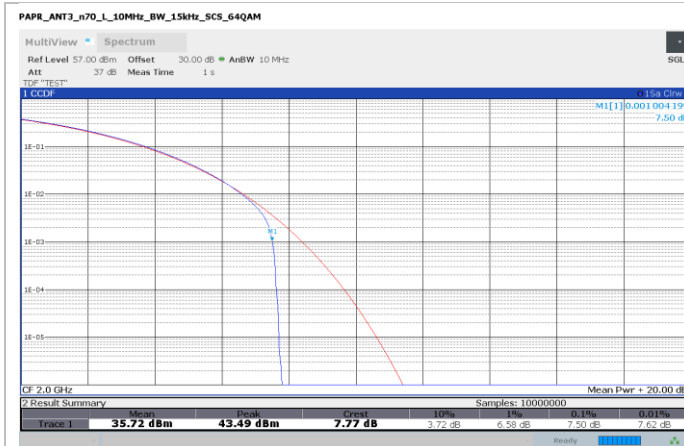
Band n70

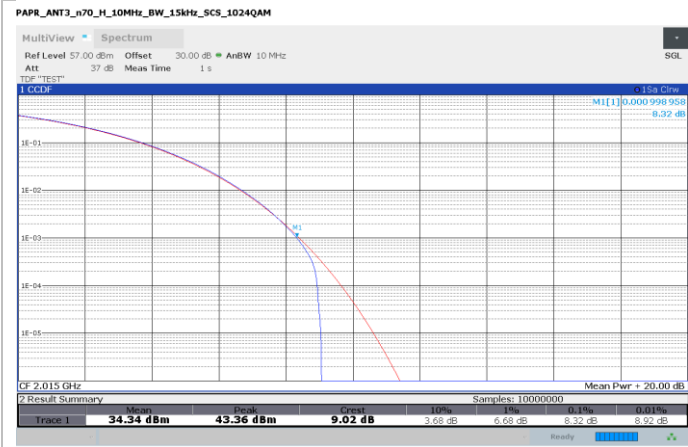
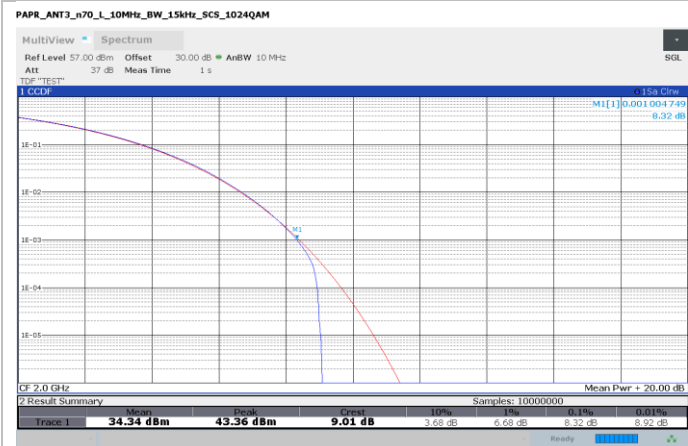
10 MHz



Section 8
Test name
Specification

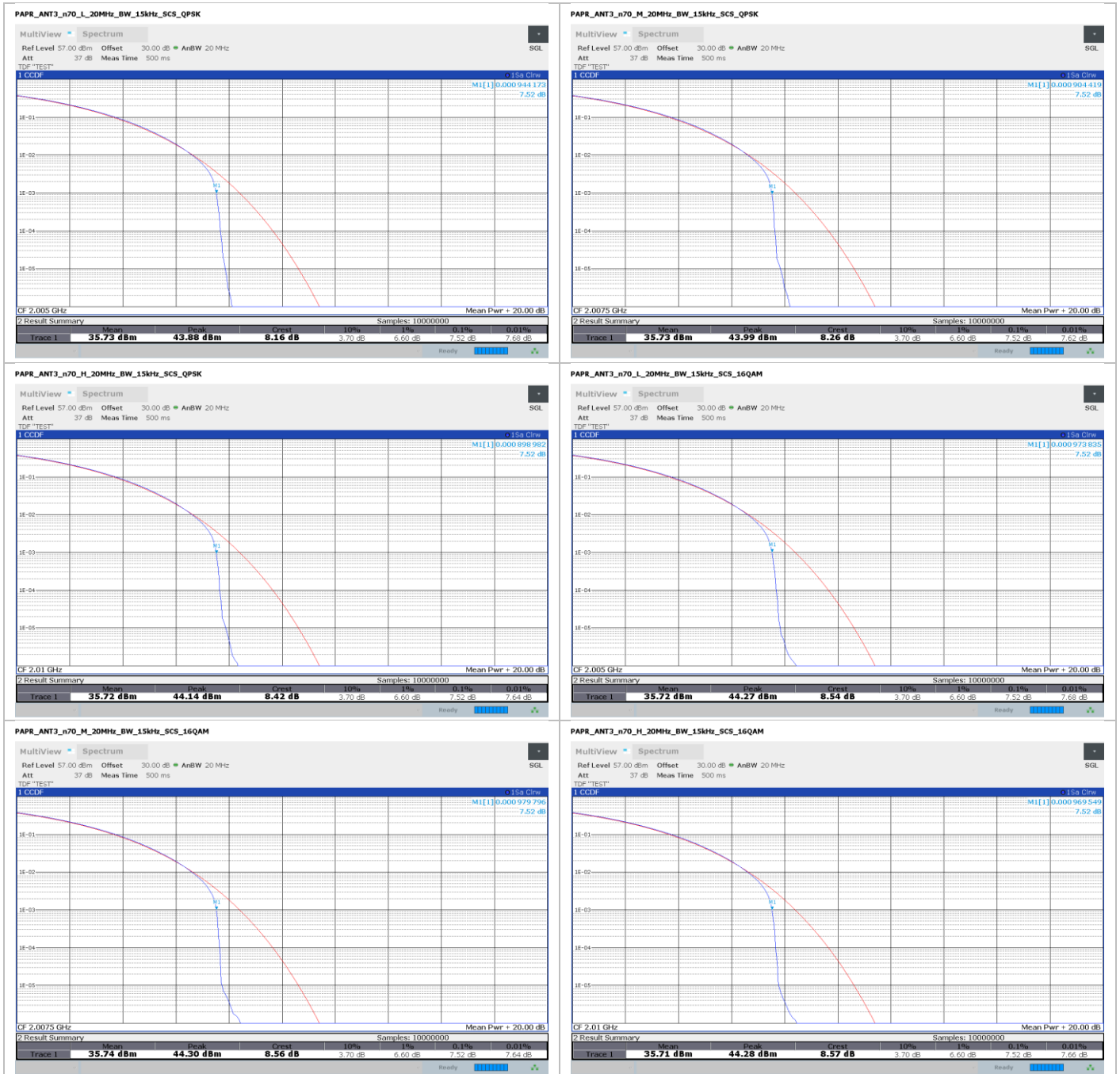
Testing
FCC 27.50(d)(5) Peak to Average Power Ratio
FCC Part 27





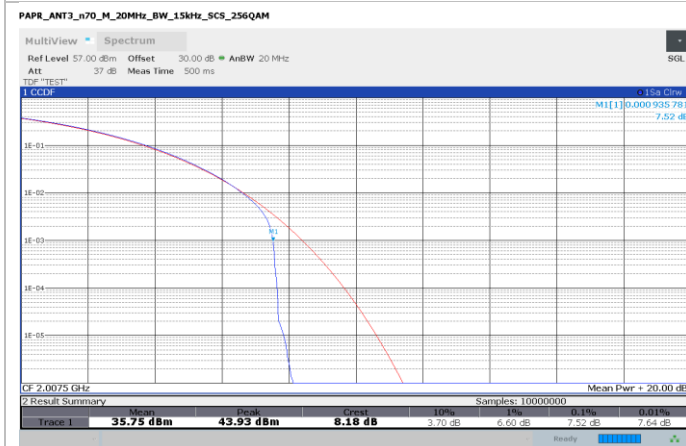
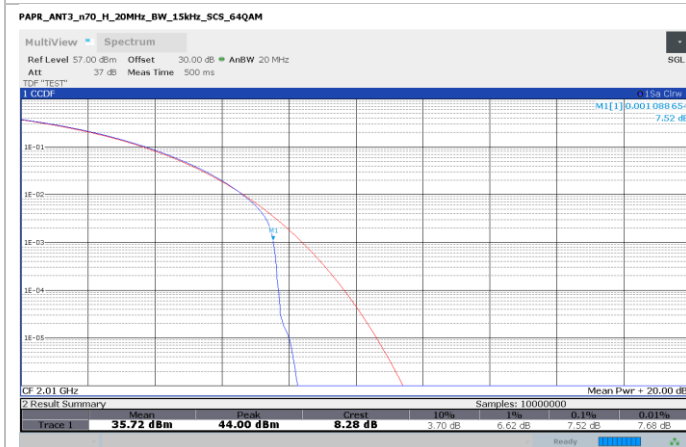
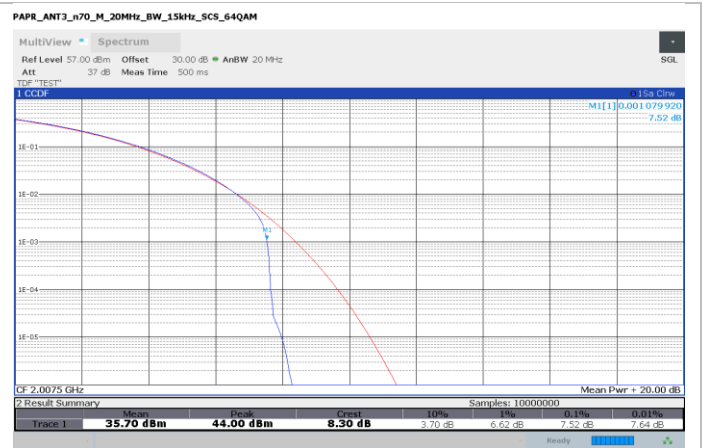
Band n70

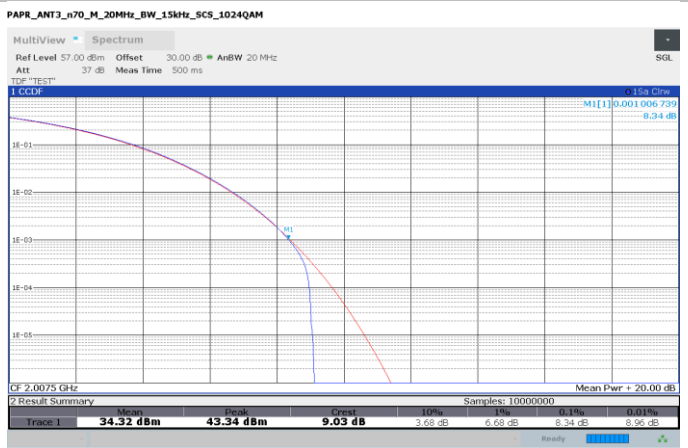
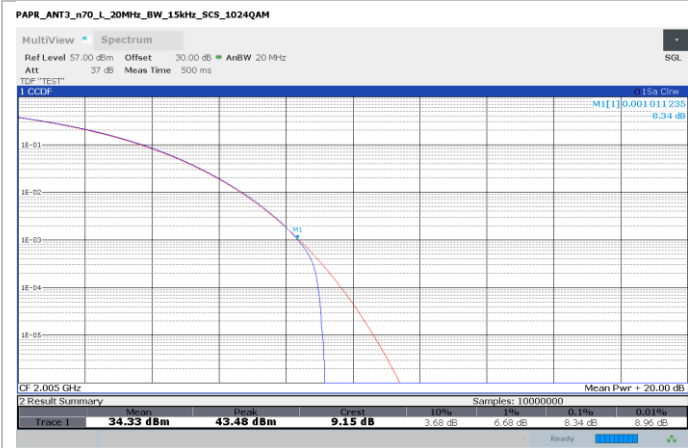
20 MHz



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Test name
Specification

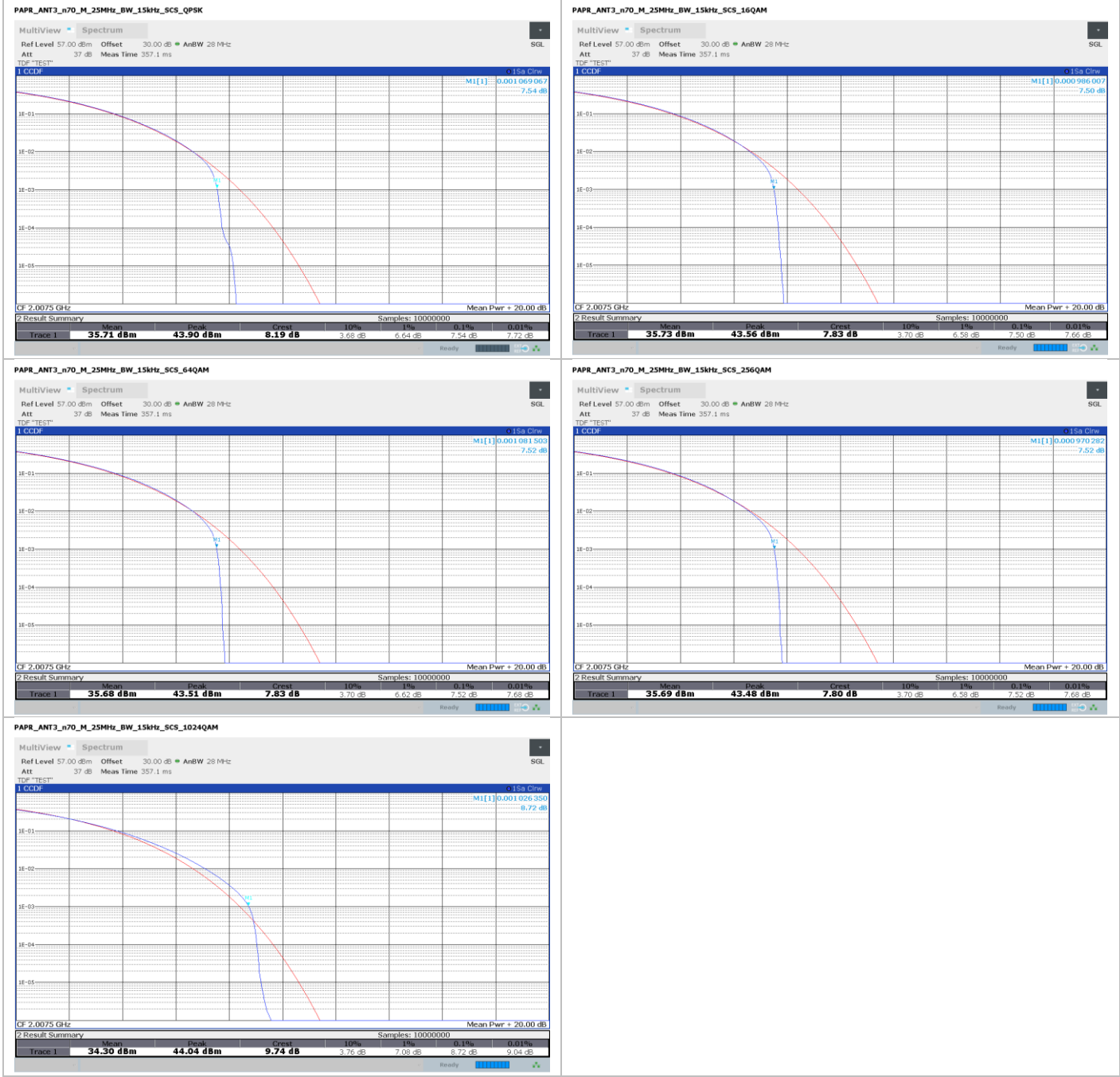
Testing
FCC 27.50(d)(5) Peak to Average Power Ratio
FCC Part 27





Band n70

25 MHz



8.6 FCC 27.53(h) Emission Limits

8.6.1 Definitions and limits

- (h) AWS emission limits -
- (1) General protection levels. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.
 - (2) Additional protection levels. Notwithstanding the foregoing paragraph (h)(1) of this section:
 - (i) Operations in the 2180-2200 MHz band are subject to the out-of-band emission requirements set forth in § 27.1134 for the protection of federal government operations operating in the 2200-2290 MHz band.
 - (ii) For operations in the 2000-2020 MHz band, the power of any emissions below 2000 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iii) For operations in the 1915-1920 MHz band, the power of any emission between 1930-1995 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.
 - (iv) For operations in the 1995-2000 MHz band, the power of any emission between 2005-2020 MHz shall be attenuated below the transmitter power (P) in watts by at least $70 + 10 \log_{10}(P)$ dB.

§ 27.1134:

- (e) Protection of Federal operations in the 2200-2290 MHz band -
- (1) Default emission limits. Except as provided in paragraph (e)(2) of this section, the following default out-of-band emissions limits shall apply for AWS-4 operations in the 2180-2200 MHz band.
 - (i) For these AWS-4 operations, the power of any emissions on all frequencies between 2200 and 2290 MHz shall not exceed an EIRP of -100.6 dBW/4 kHz.

8.6.2 Test summary

Test date	July 25, 2022	Temperature	21 °C
Test engineer	Lan Sayasane, EMC Test Engineer	Air pressure	1005 mbar
Verdict	Pass	Relative humidity	64%

8.6.3 Observations, settings and special notes

EUT setup configuration	Table top
Test facility	3 m Semi anechoic chamber
Measuring distance	3m
Antenna height variation	1–4 m
Turn table position	0–360°
Measurement details	A preview measurement was generated with receiver in continuous scan or sweep mode while the EUT was rotated and antenna adjusted to maximize radiated emission. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

Receiver/spectrum analyzer settings for frequencies below 1 GHz:

Resolution bandwidth	120 kHz
Video bandwidth	300 kHz
Detector mode	– Peak (Preview measurement) – Quasi-peak (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Quasi-peak final measurement)

Receiver/spectrum analyzer settings for frequencies above 1 GHz:

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Detector mode	Peak (Preview measurement) Peak and CAverage (Final measurement)
Trace mode	Max Hold
Measurement time	– 100 ms (Peak preview measurement) – 5000 ms (Peak and CAverage final measurement)

Spectrum analyzer settings (conducted test):

Resolution bandwidth	1 MHz
Video bandwidth	3 MHz
Frequency span	Sufficient for making an accurate measurement
Detector mode	RMS
Trace mode	Max Hold

This test was realized in two parts: one with a conducted setup and another one with a radiated setup.

The conducted test was made on Port D (Band n66) and Port C (Band n70) (the port was selected based on test showed on section 8.4), transmitting at max power and with the other three ports loaded with 50 Ω loads. For capturing the signal with the equipment, it was divided in three ranges, using a transducer factor to compensate the losses caused by a cable and attenuator used to protect the test equipment. Additional to this number, a 6.02 dB correlation factor was added to evaluate the complete power across the four ports, considering the ranges where harmonic can be observed. The first range was measured from 30 MHz to 3 GHz where the fundamental signal is visible. The second and third range was selected from 3 GHz to 15 GHz and 15 – 26 GHz respectively, where the internal attenuator was reduced significantly to get a good noise floor level. Both ranges used the 6.02 dB offset and a transducer factor (include the cable losses and attenuator). The evaluation was made using the three channels and all the modulations (QPSK, 16QAM, 64QAM, 256QAM, and 1024QAM).

The radiated test was made transmitting to max power too with the four ports terminated with 50 Ω loads. The scans were made from 30 MHz to 26 GHz considering all the channels but only the modulation with the highest power as was showed at section 8.4.

Based on equation 43 + 10 log₁₀ (P) dB, the general emission limit is -13 dBm (conducted and radiated test) or the equivalent at 3m is 82.23 dB μ V/m above 1 GHz and 84.38 dB μ V/m below 1 GHz.

Based on equation 70 + 10 log₁₀ (P) dB, the additional emission limit of 27.53(h)(2)(iii), (iv) and (v) is -40 dBm (conducted and radiated test) or the equivalent at 3m is 55.23 dB μ V/m above 1 GHz and 57.38 dB μ V/m below 1 GHz.

8.6.4 Test data

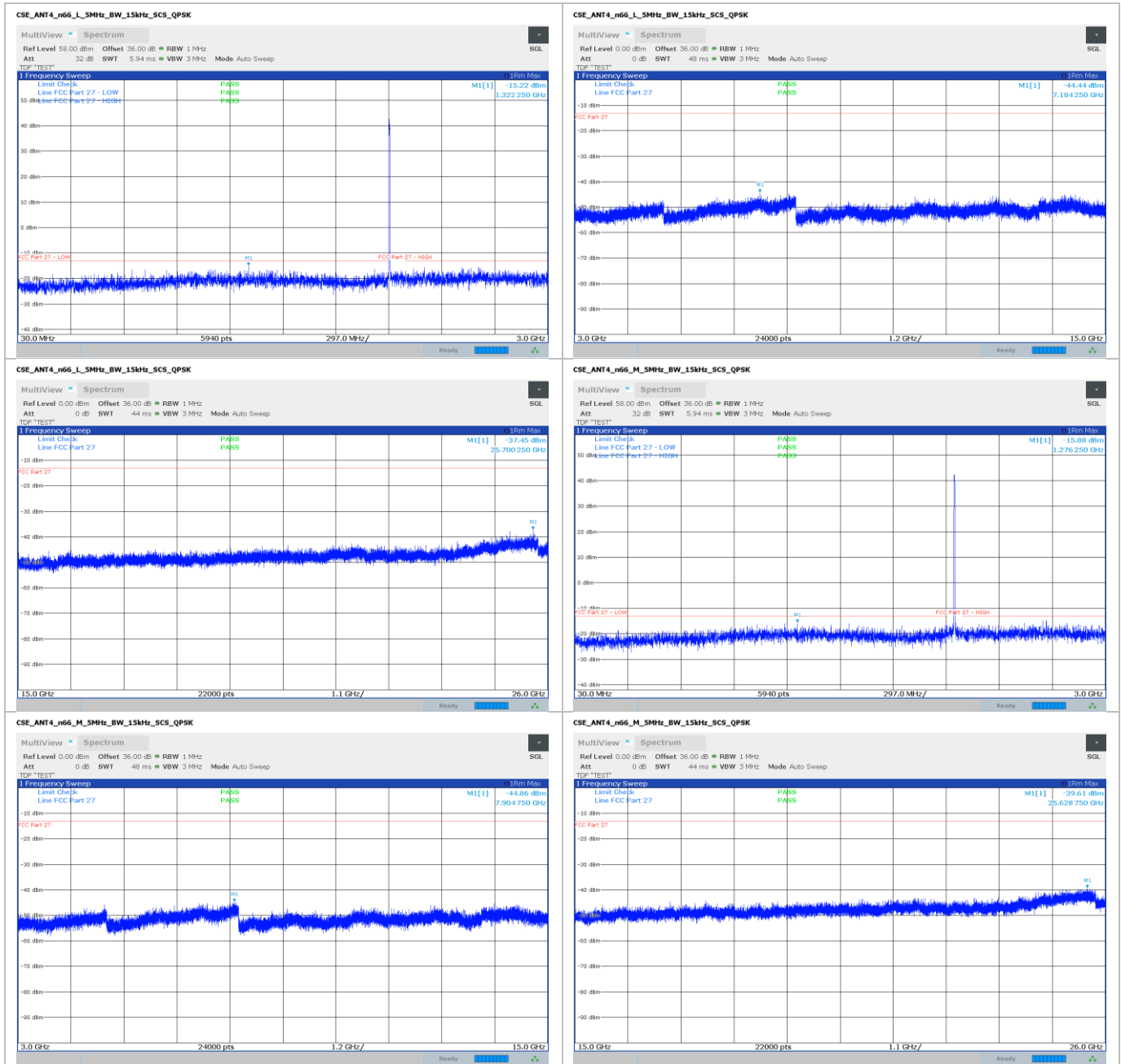
Band n66 – conducted spurious emissions			5 MHz	
Identification of correct limit:				
Channel	Bandwidth (MHz)	Frequency (MHz)	Applicable rule part	Limit
LOW	5	2112.5	27.53(h)(2)(ii) < 2000 MHz	-40 dBm
			27.53(h)(1) ≥ 2000 MHz	-13 dBm
MID	5	2155.0	27.53(h)(1)	-13 dBm
HIGH	5	2197.5	27.53(h)(1)	-13 dBm
			27.1134 (2200 – 2290 MHz)	-100.6 dBW/4kHz
LOW	10	2115	27.53(h)(2)(ii) < 2000 MHz	-40 dBm
			27.53(h)(1) ≥ 2000 MHz	-13 dBm
MID	10	2155.0	27.53(h)(1)	-13 dBm
HIGH	10	2195	27.53(h)(1)	-13 dBm
			27.1134 (2200 – 2290 MHz)	-100.6 dBW/4kHz
LOW	15	2117.5	27.53(h)(2)(ii) < 2000 MHz	-40 dBm
			27.53(h)(1) ≥ 2000 MHz	-13 dBm
MID	15	2155.0	27.53(h)(1)	-13 dBm
HIGH	15	2192.5	27.53(h)(1)	-13 dBm
			27.1134 (2200 – 2290 MHz)	-100.6 dBW/4kHz
LOW	20	2120.0	27.53(h)(2)(ii) < 2000 MHz	-40 dBm
			27.53(h)(1) ≥ 2000 MHz	-13 dBm

Section 8
Test name
Specification

Testing data
FCC 27.53(m) Emission limits
FCC Part 27

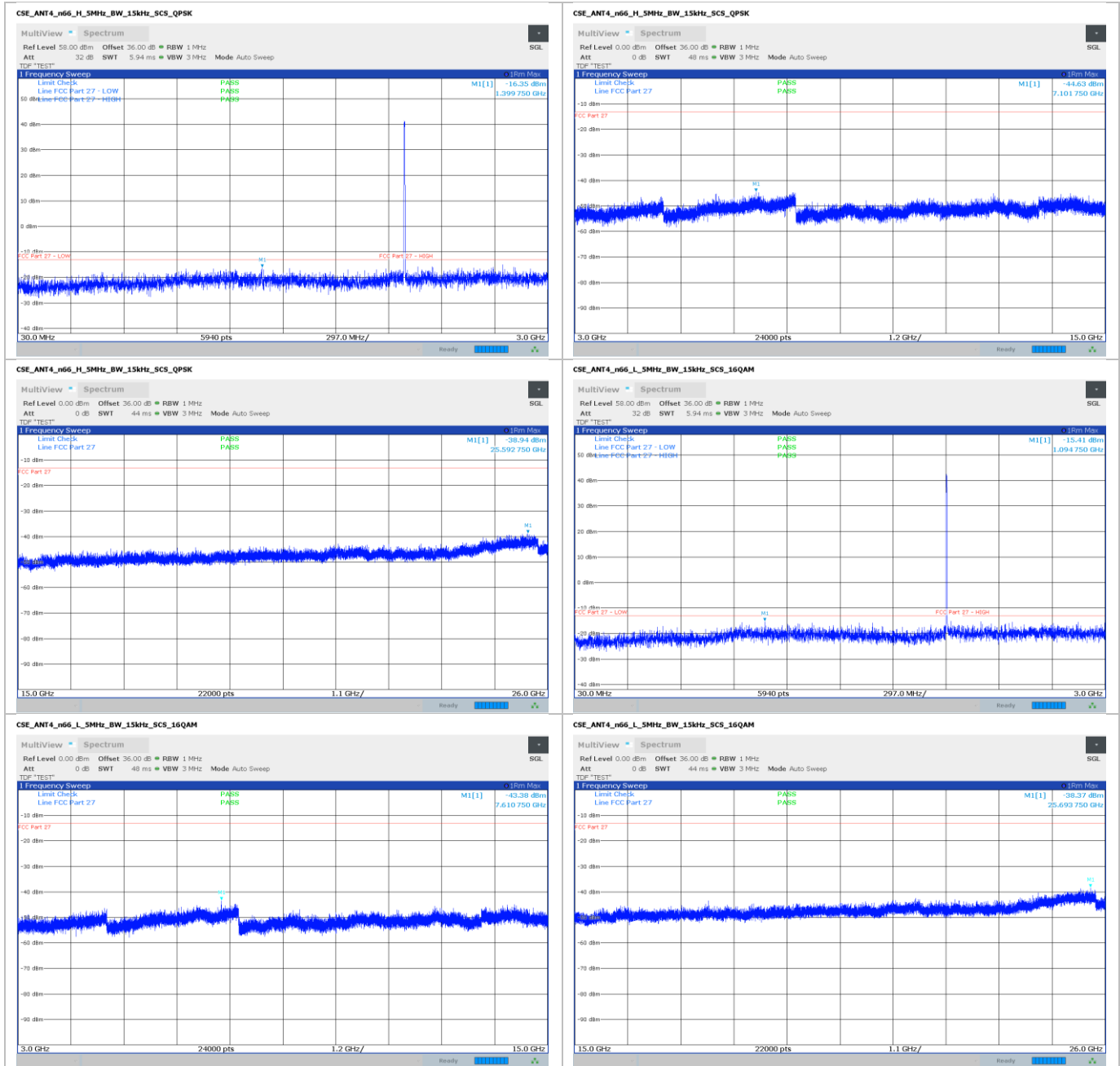


MID	20	2155.0	27.53(h)(1)	-13 dBm
HIGH	20	2190	27.53(h)(1)	-13 dBm
			27.1134 (2200 – 2290 MHz)	-100.6 dBW/4kHz



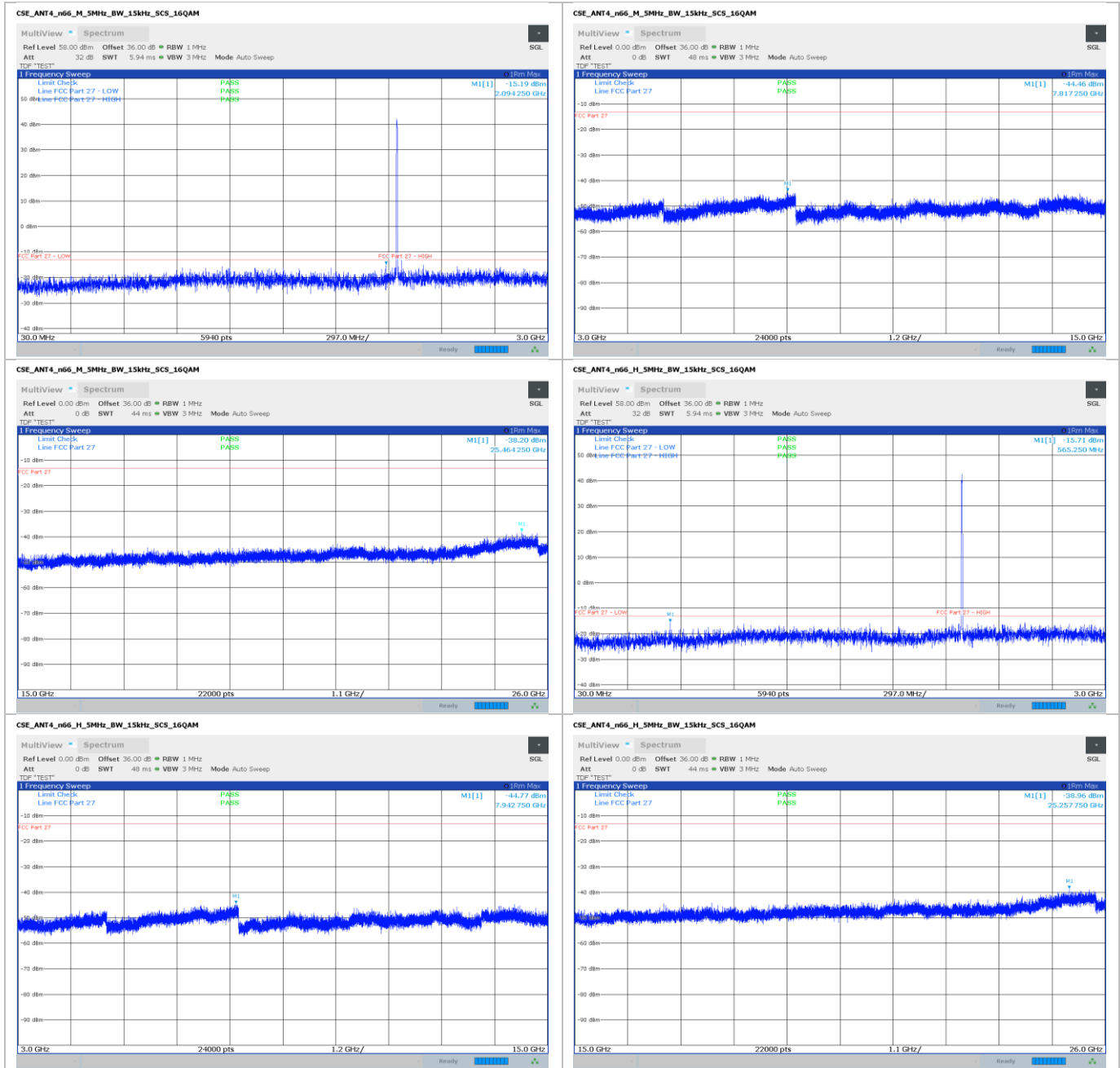
Section 8
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Testing data
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FCC Part 27



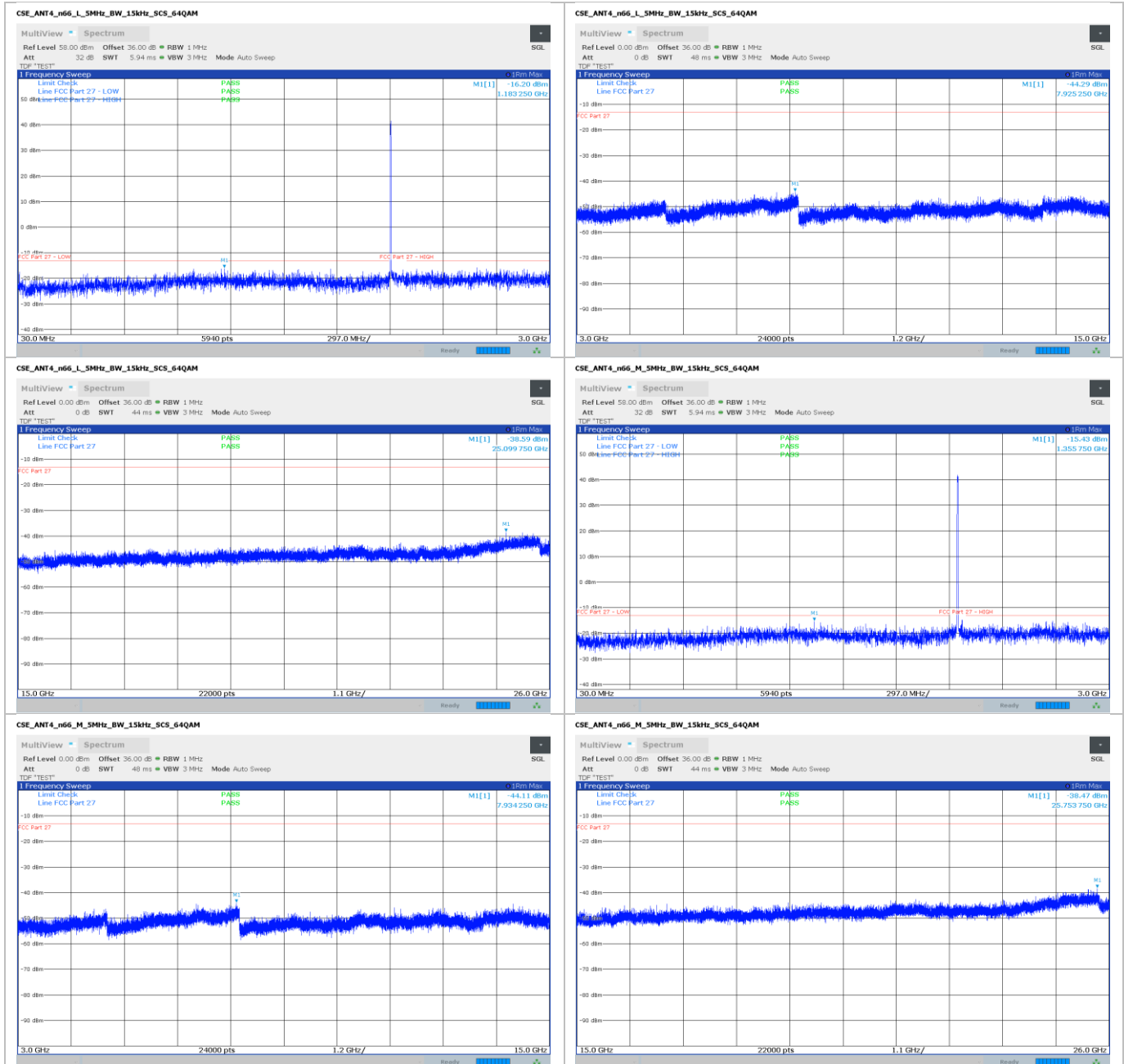
Section 8
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Testing data
FCC 27.53(m) Emission limits
FCC Part 27



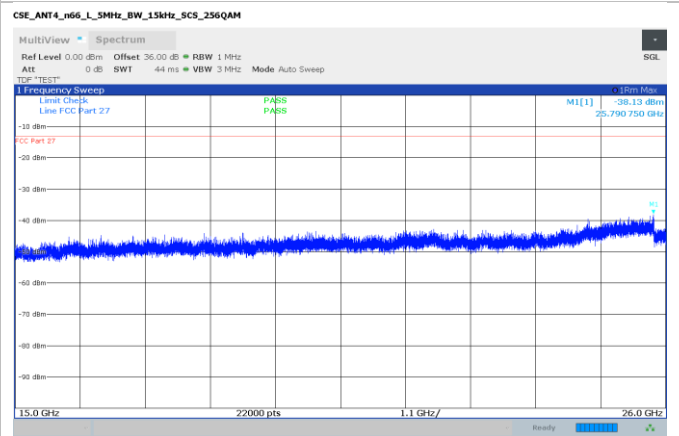
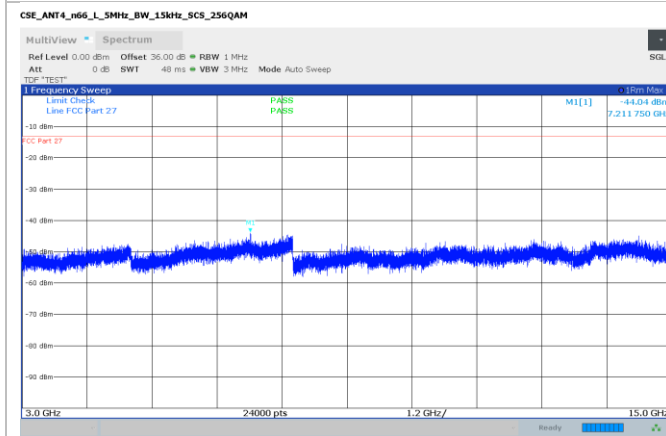
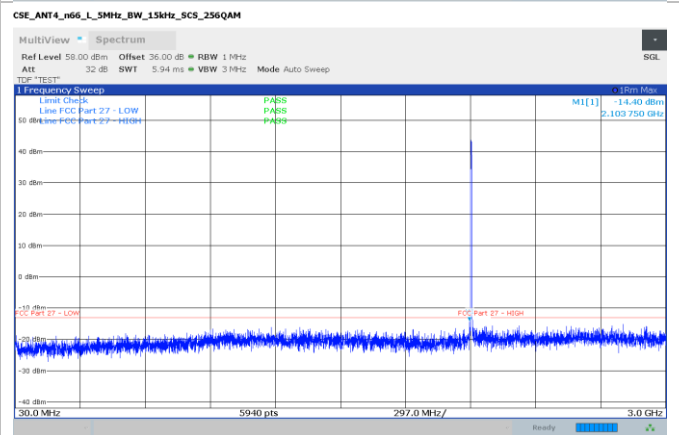
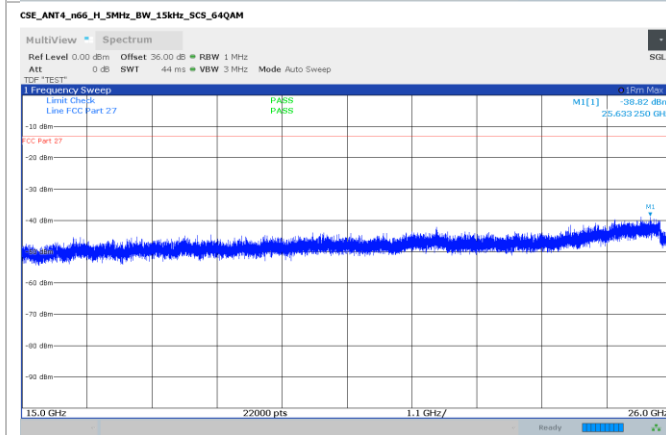
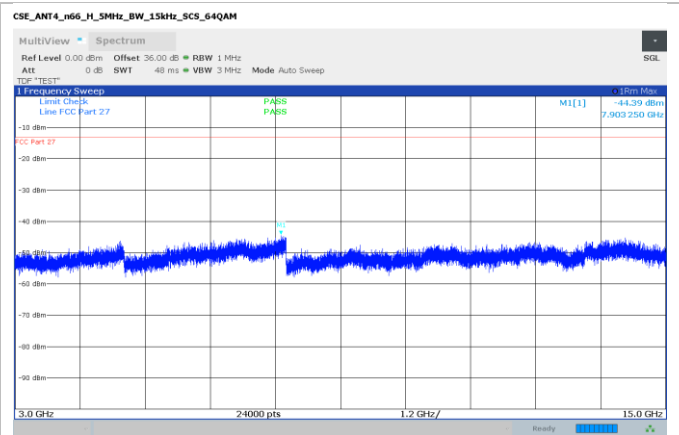
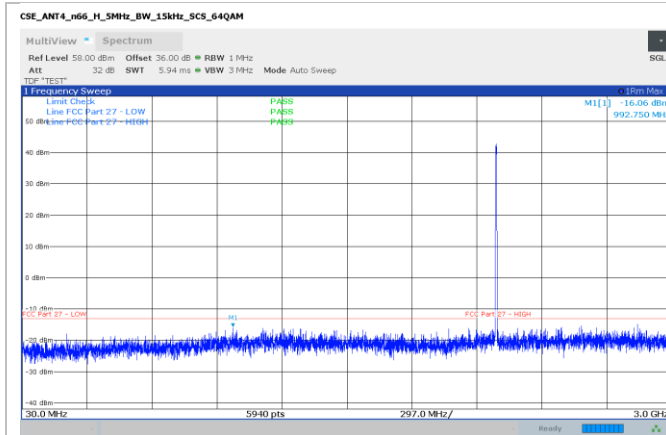
Section 8
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Testing data
FCC 27.53(m) Emission limits
FCC Part 27



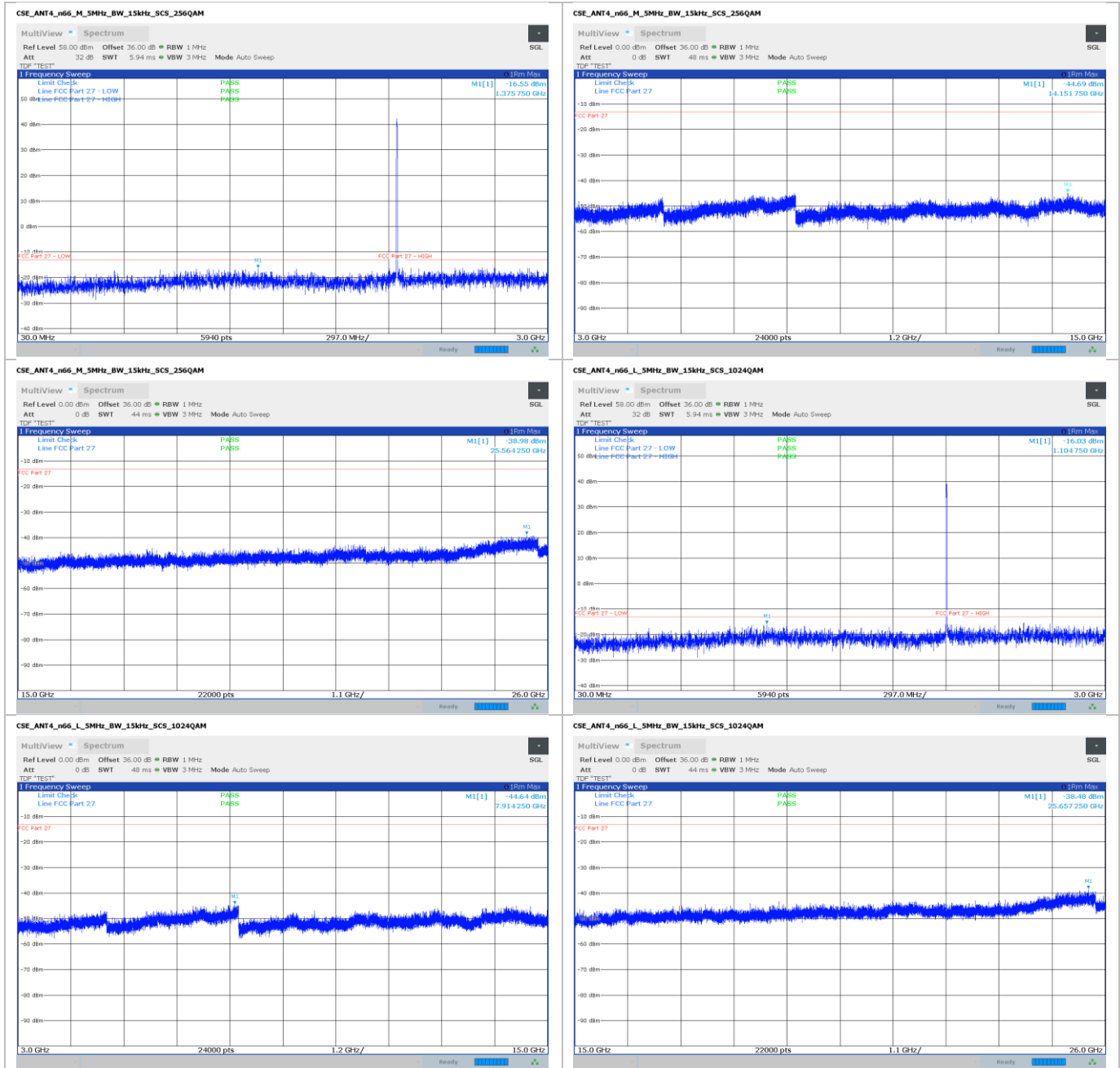
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Testing data
FCC 27.53(m) Emission limits
FCC Part 27



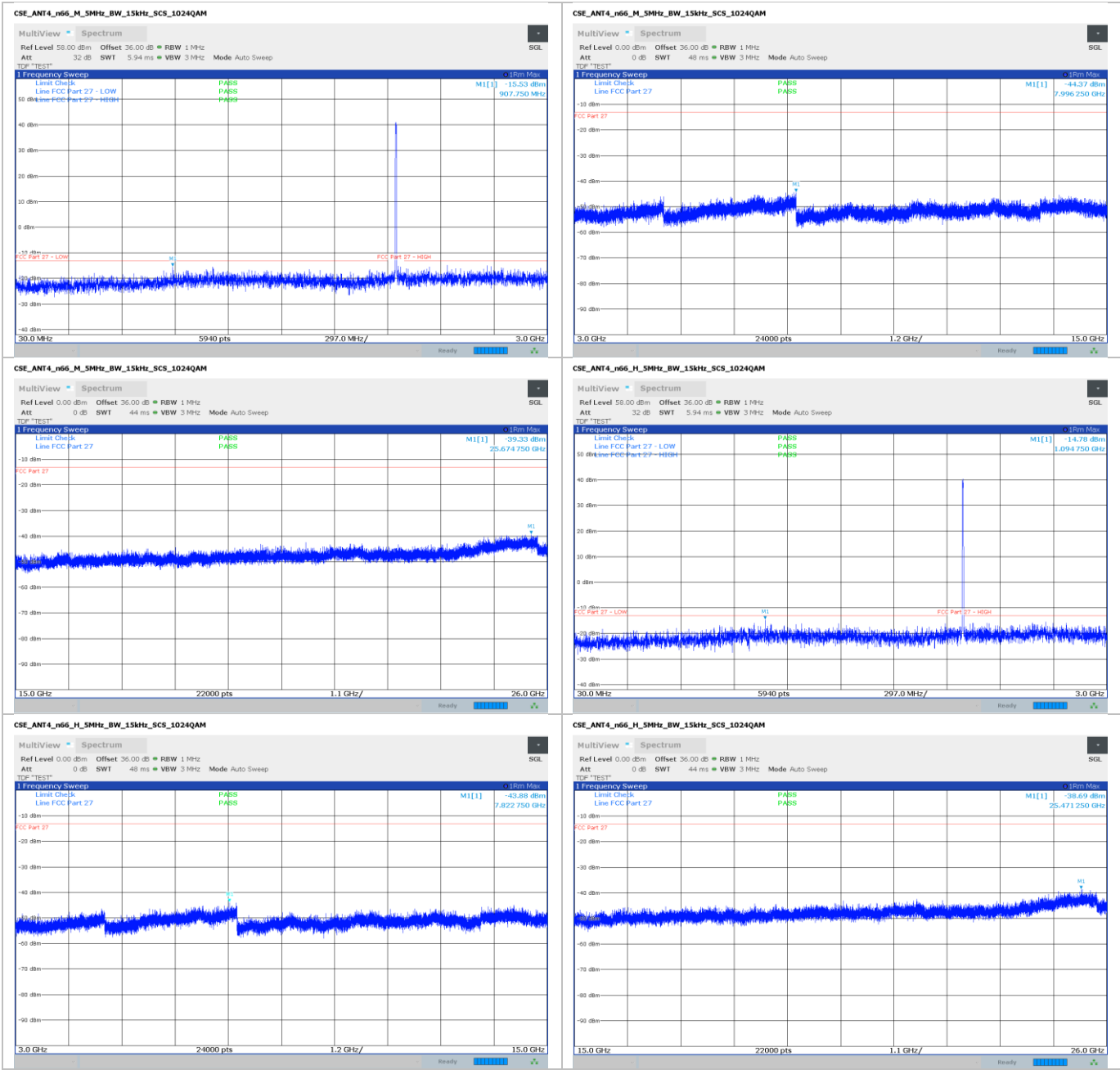
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Testing data
FCC 27.53(m) Emission limits
FCC Part 27



Section 8
Test name
Specification

Testing data
FCC 27.53(m) Emission limits
FCC Part 27



Band n66 – band edge

5 MHz

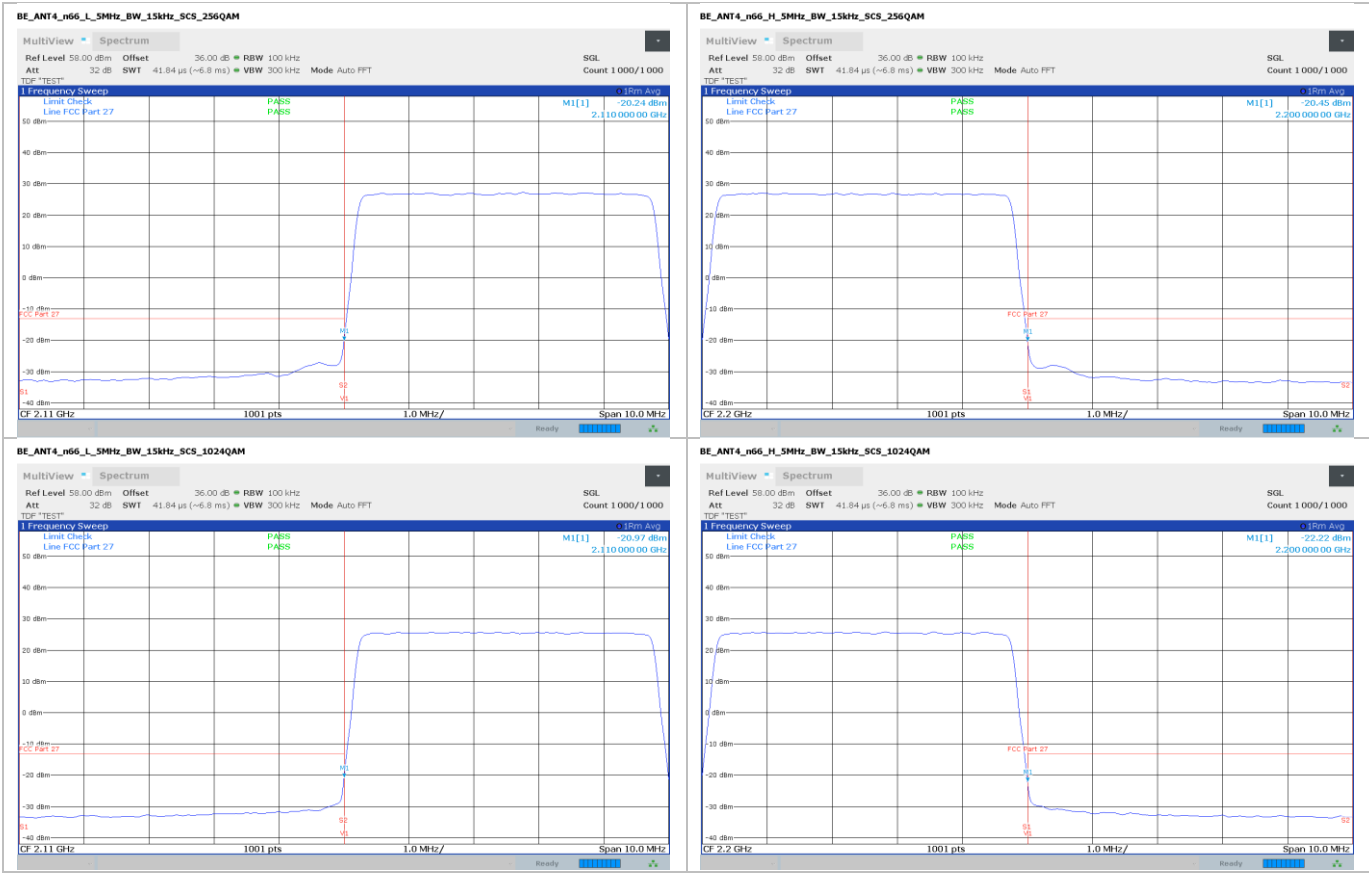
Section 8
Test name
Specification

Testing data
FCC 27.53(m) Emission limits
FCC Part 27



Section 8
Test name
Specification

Testing data
FCC 27.53(m) Emission limits
FCC Part 27



Band n66 – conducted spurious emissions

10 MHz

