

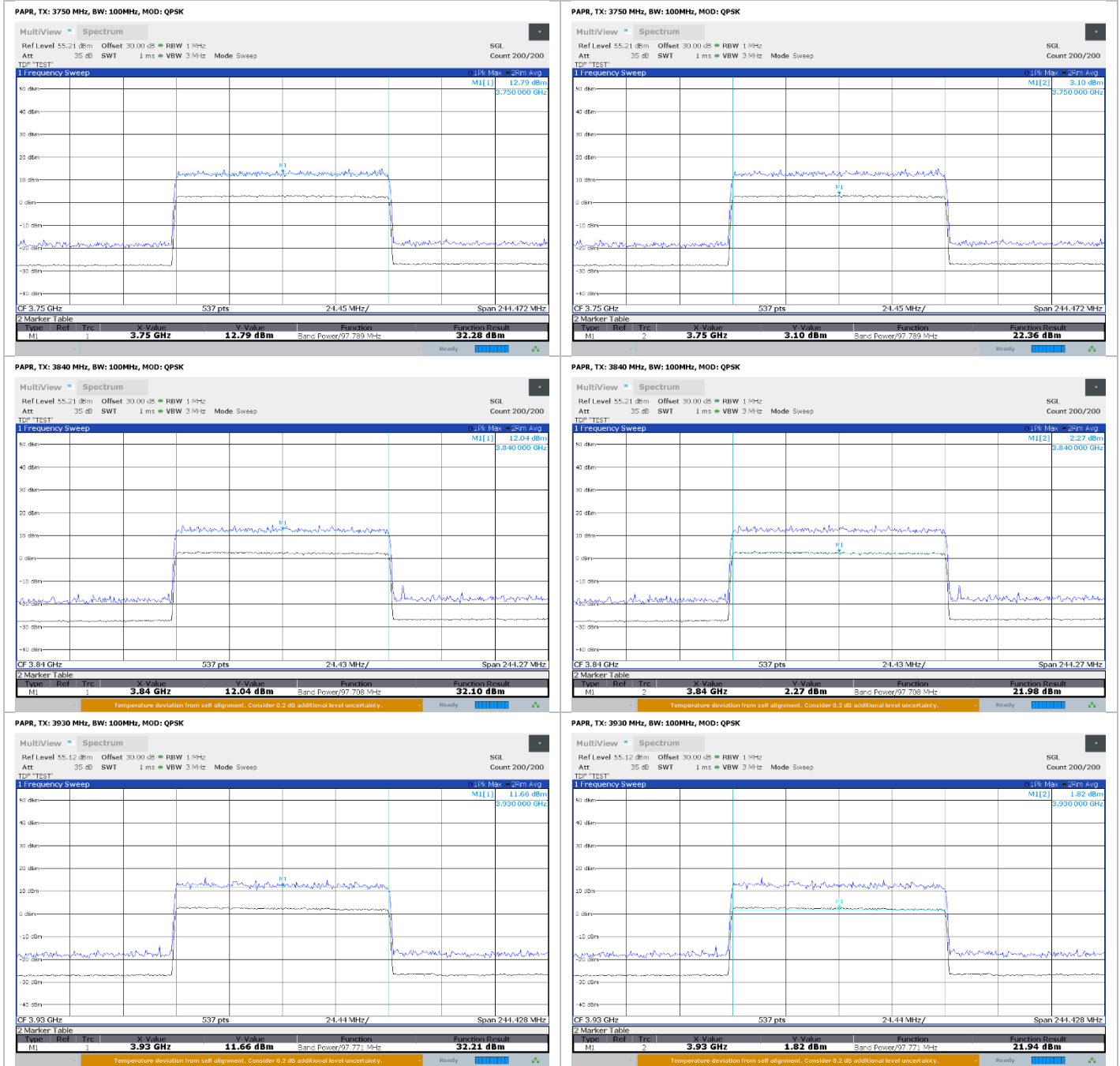
Section 8
Test name
Specification

Testing
FCC 27.50(j)(4) Peak to Average Power Ratio
FCC Part 27



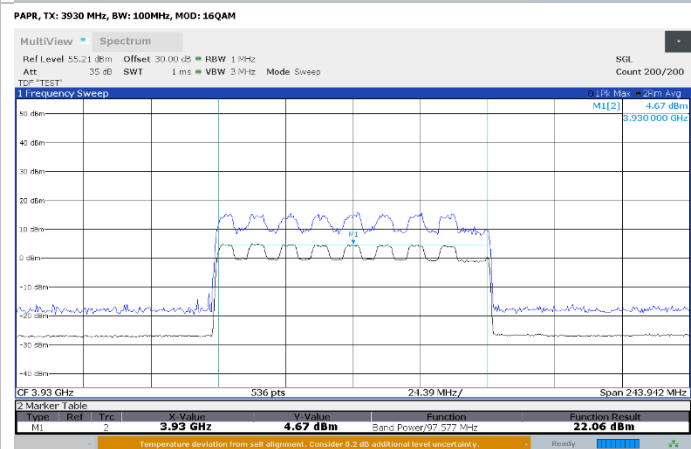
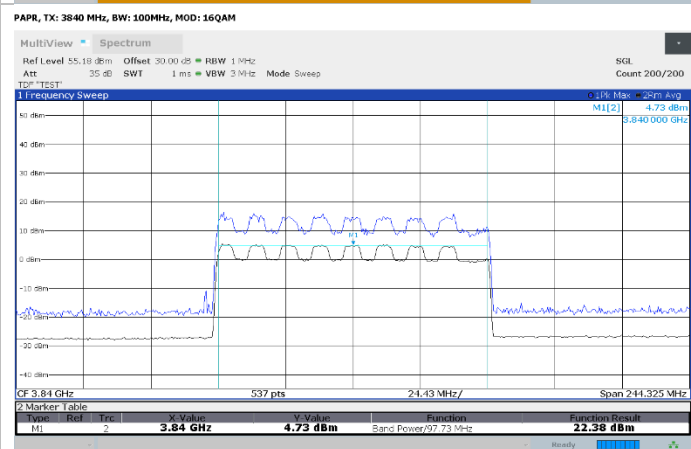
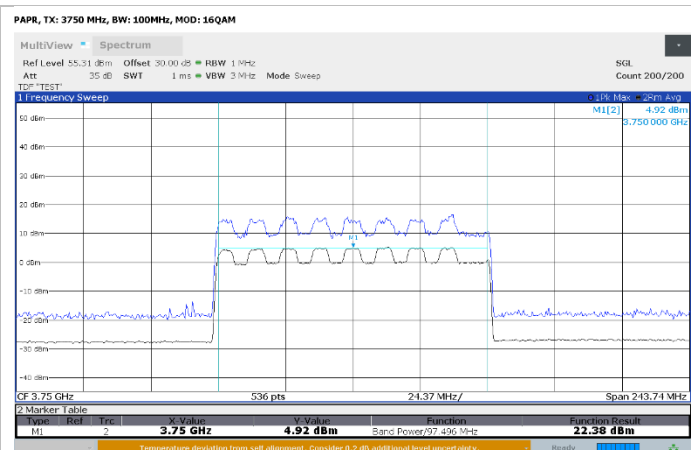
Band n77

Bandwidth: 100 MHz



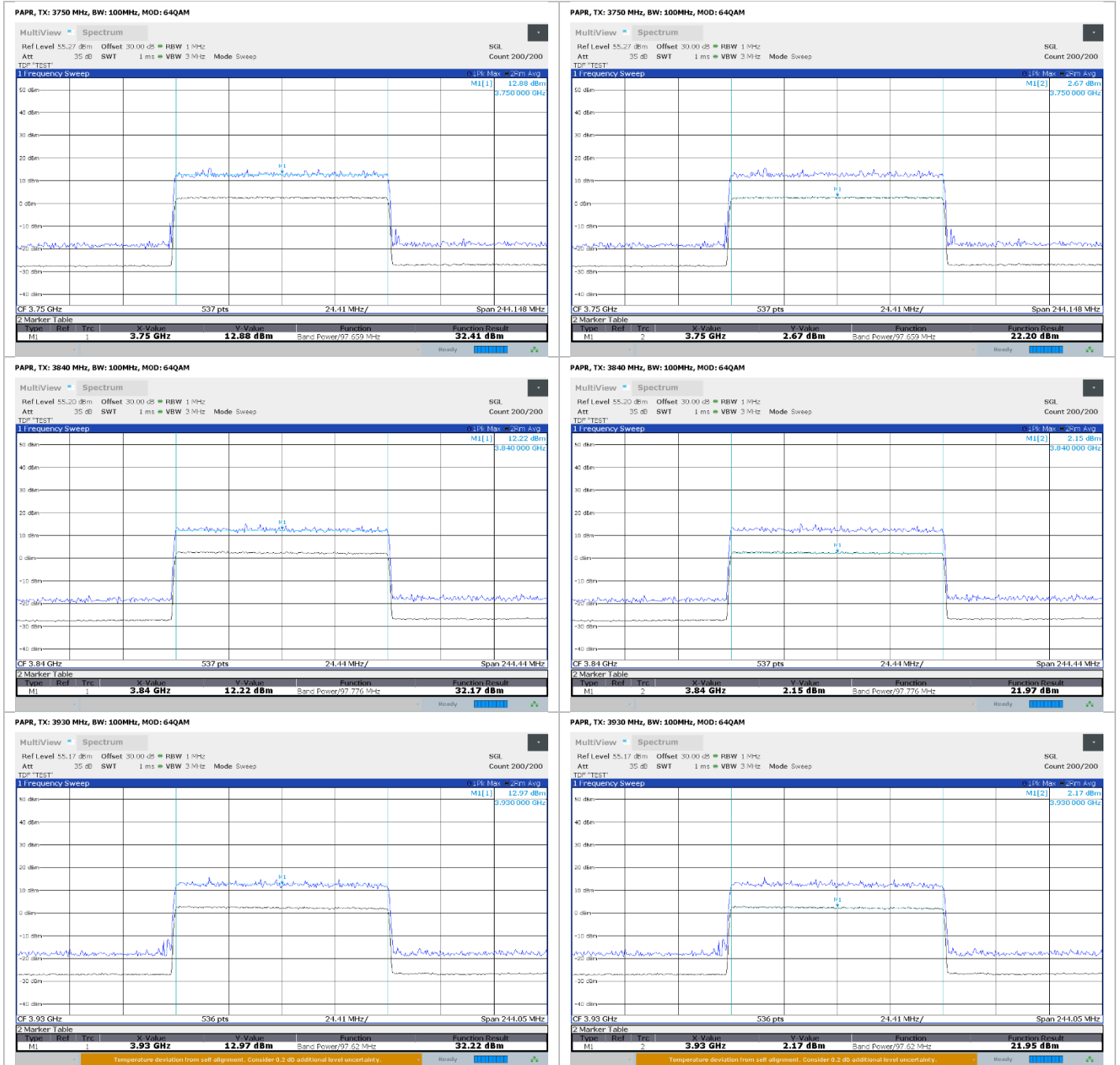
Section 8
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FCC 27.50(j)(4) Peak to Average Power Ratio
FCC Part 27



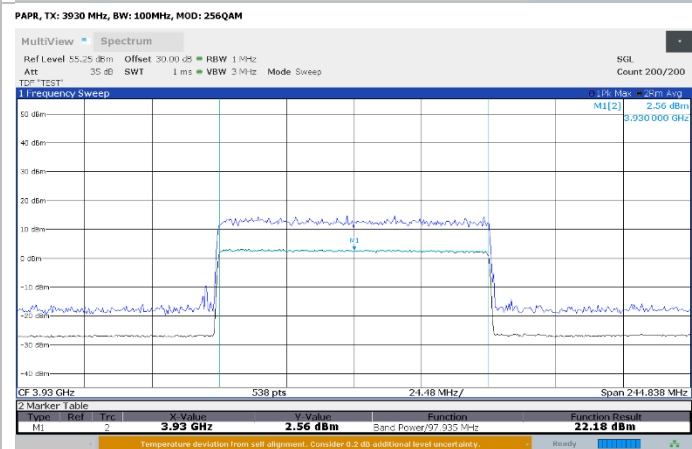
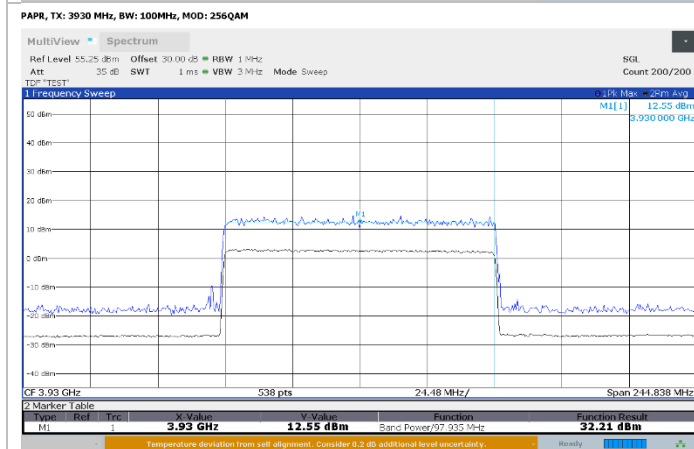
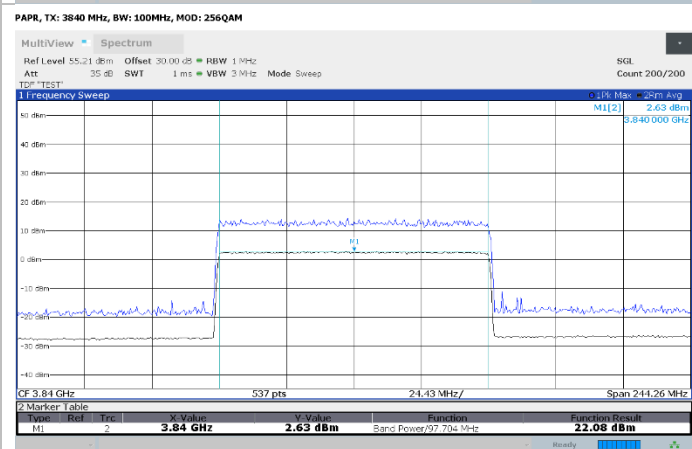
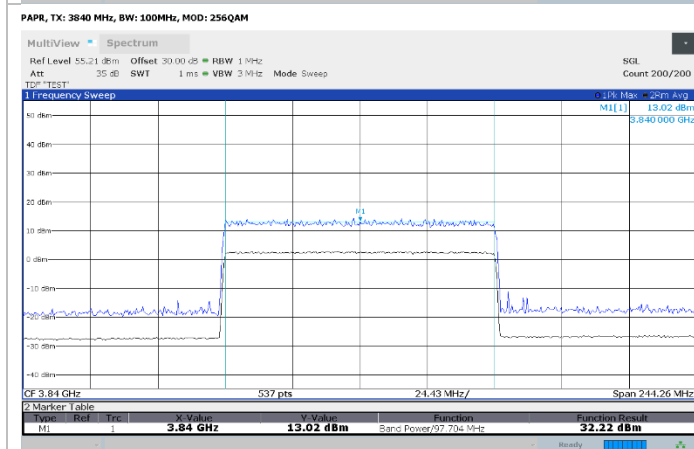
Section 8
Test name
Specification

Testing
FCC 27.50(j)(4) Peak to Average Power Ratio
FCC Part 27



Section 8
Test name
Specification

Testing
FCC 27.50(j)(4) Peak to Average Power Ratio
FCC Part 27



8.6 FCC 27.53(l) Emission Limits

8.6.1 Definitions and limits

(l) 3.7 GHz Service. The following emission limits apply to stations transmitting in the 3700–3980 MHz band:

(1) For base station operations in the 3700–3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed –13 dBm/MHz. Compliance with this paragraph (l)(1) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

8.6.2 Test summary

Test date	November 17, 2023	Temperature	21 °C
Test engineer	Chenhao Ma Wireless test technician	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.

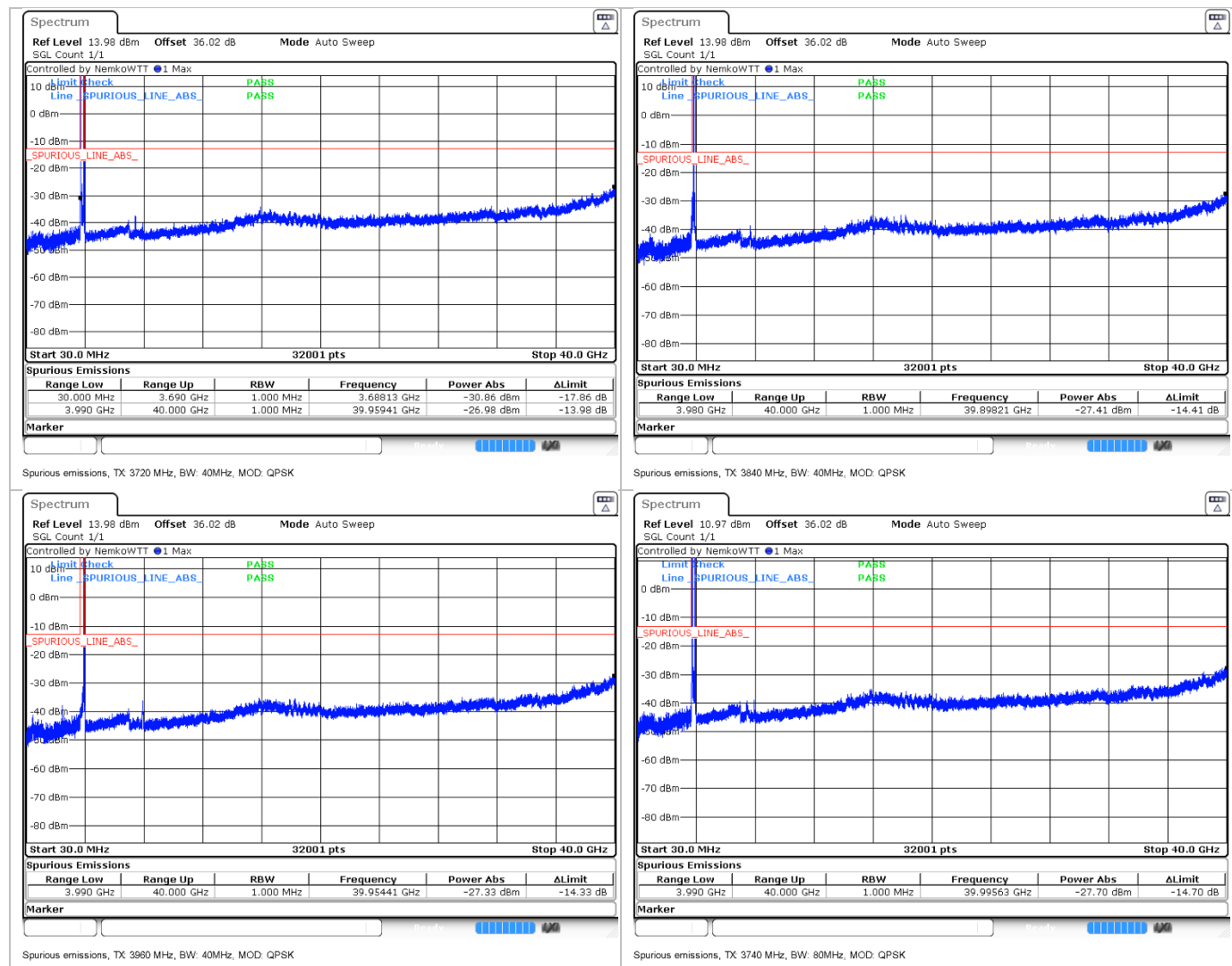
A 30 dB attenuator was placed between the EUT and spectrum analyzer and compensated for as a reference level offset. Additionally, to correct for MIMO considerations, an additional offset of $10\log(4) = 6.02$ dB was included to compensate for 4 correlated antenna outputs. The loss of the connecting cable was compensated for as a transducer factor in the spectrum analyzer.

For band edge tests, in the 1 MHz region immediately outside of the authorized band, a resolution bandwidth of approximately 1 – 5 % of the 26 dB bandwidth (measured in section 8.3) was used.

Radiated spurious emissions was assessed in all modes. Only the worst-case modulation/bandwidth/channel combination is reported here. The EUT was assessed in all possible orientations with the worst case with respect to spurious emissions being reported here.

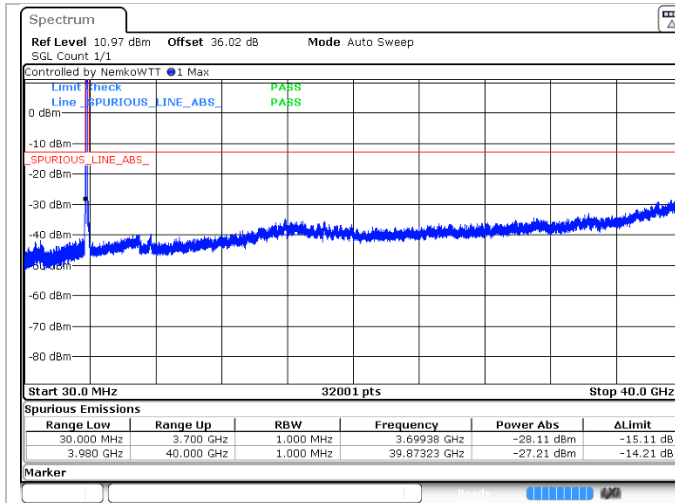
8.6.4 Test data

Band n77 – conducted spurious emissions

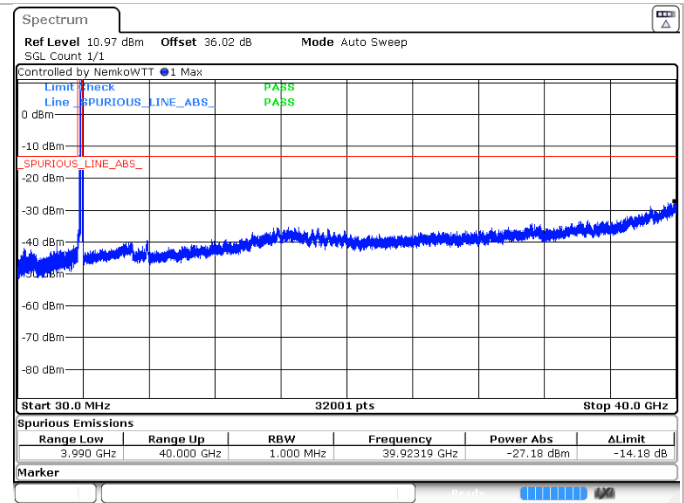


Section 8
Test name
Specification

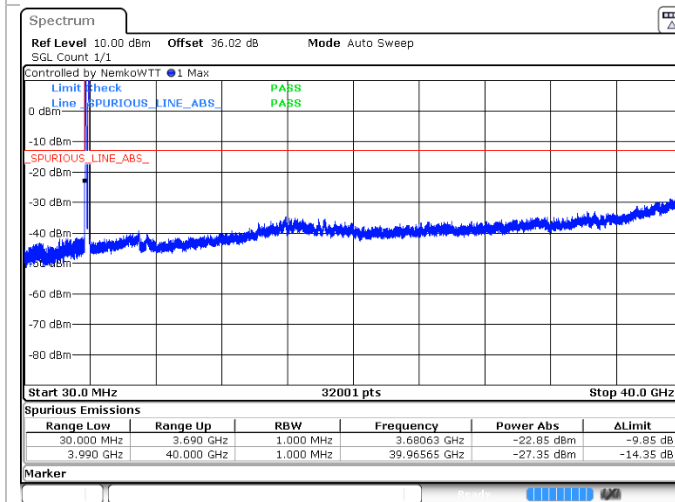
Testing data
 FCC 27.53(l) Emission limits
 FCC Part 27



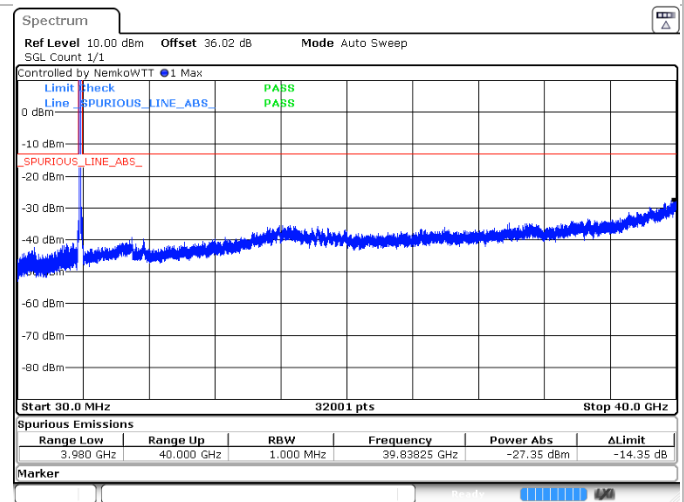
Spurious emissions, TX 3840 MHz, BW: 80MHz, MOD: QPSK



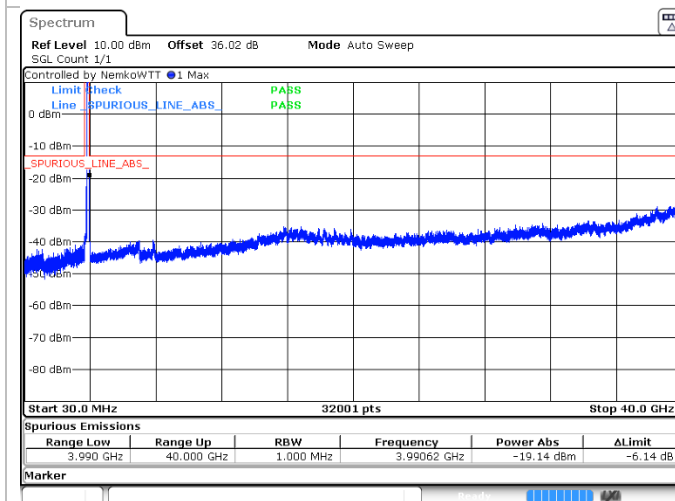
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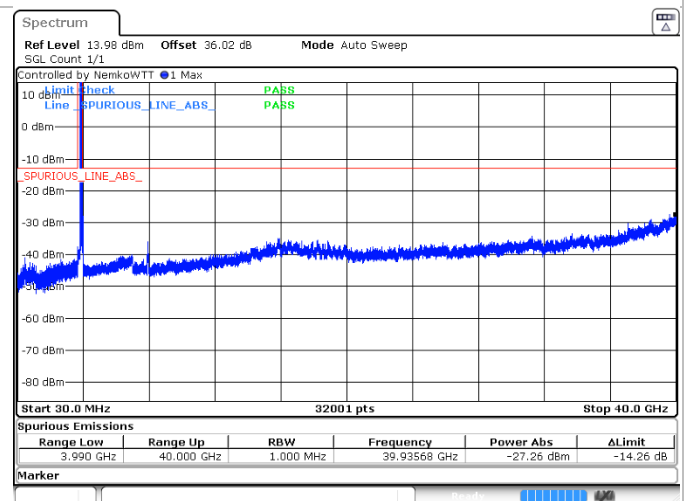
Spurious emissions, TX 3750 MHz, BW: 100MHz, MOD: QPSK



Spurious emissions, TX 3840 MHz, BW: 100MHz, MOD: QPSK



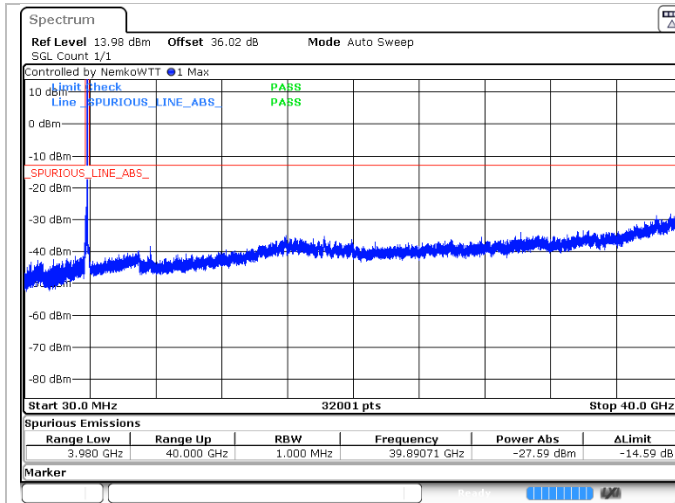
Spurious emissions, TX 3830 MHz, BW: 100MHz, MOD: QPSK



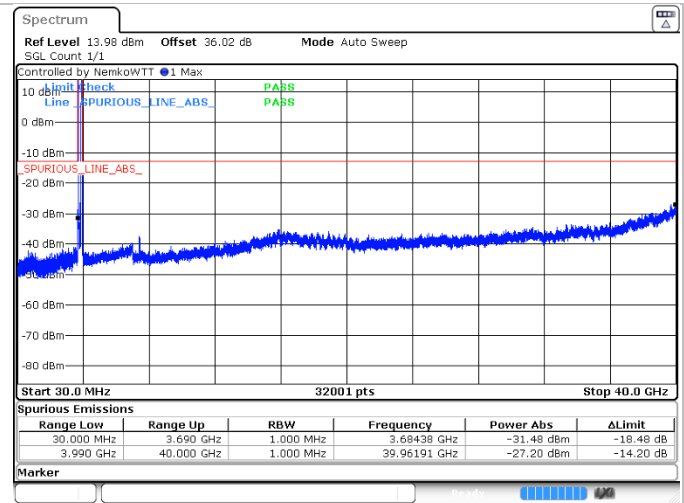
Spurious emissions, TX 3980 MHz, BW: 40MHz, MOD: 16QAM

Section 8
Test name
Specification

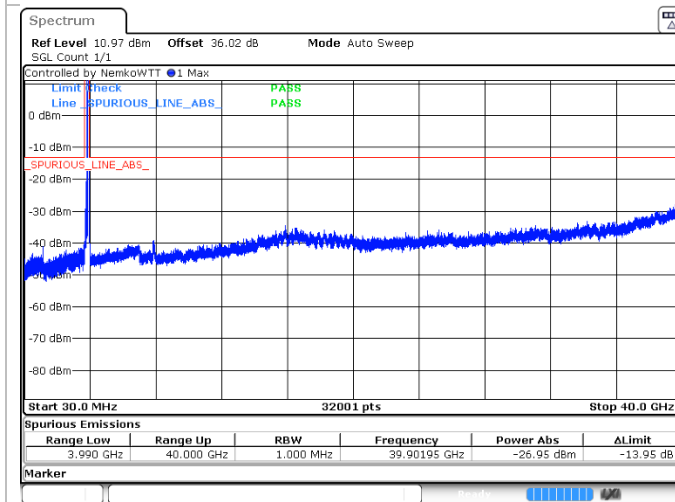
Testing data
FCC 27.53(l) Emission limits
FCC Part 27



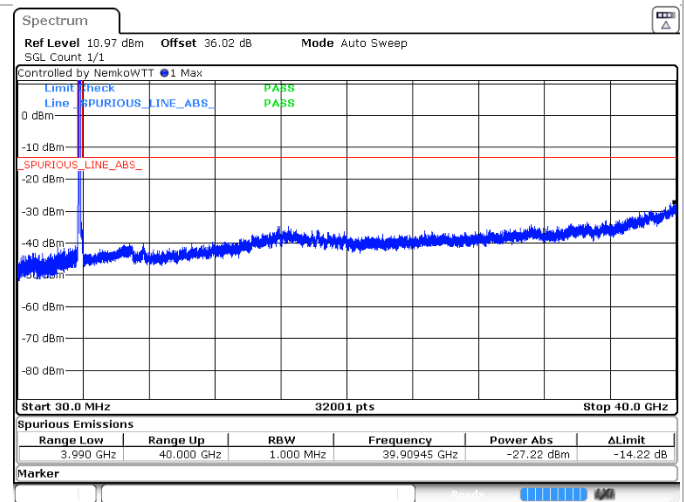
Spurious emissions, TX 3840 MHz, BW: 40MHz, MOD: 16QAM



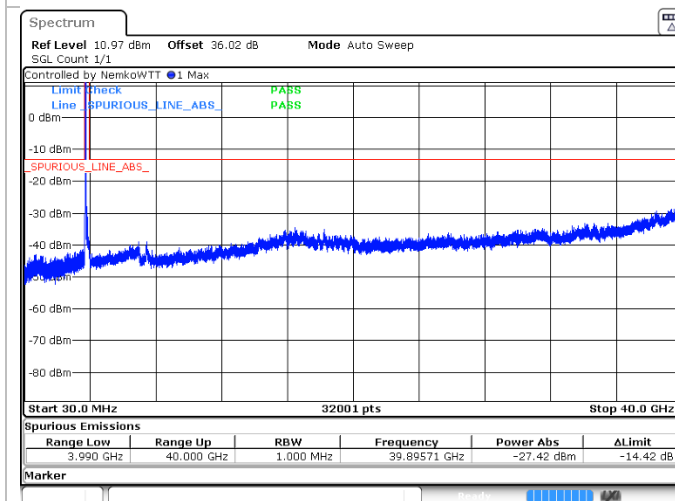
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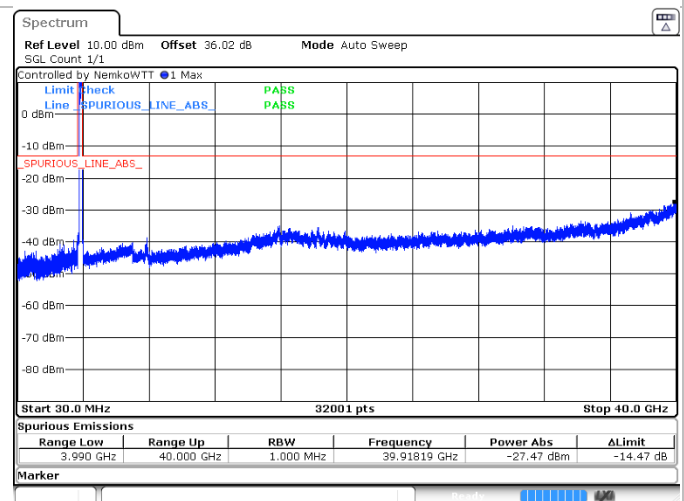
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Spurious emissions, TX 3840 MHz, BW: 80MHz, MOD: 16QAM



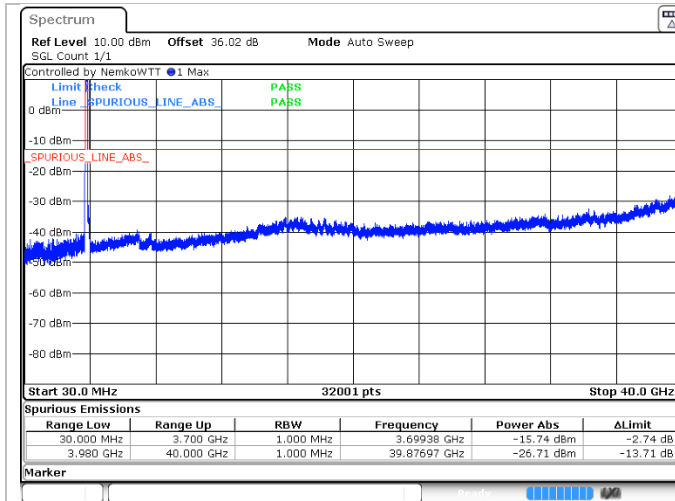
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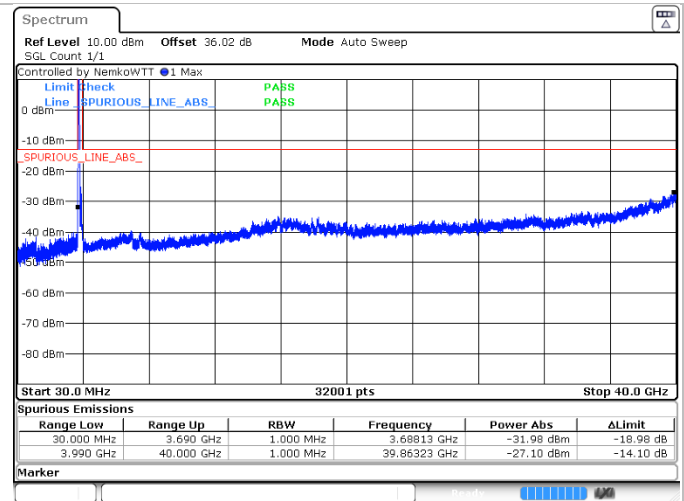
Spurious emissions, TX 3890 MHz, BW: 100MHz, MOD: 16QAM

Section 8
Test name
Specification

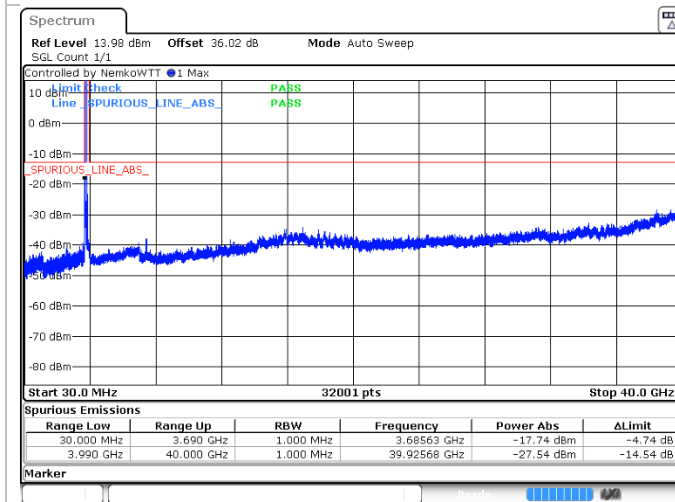
Testing data
 FCC 27.53(l) Emission limits
 FCC Part 27



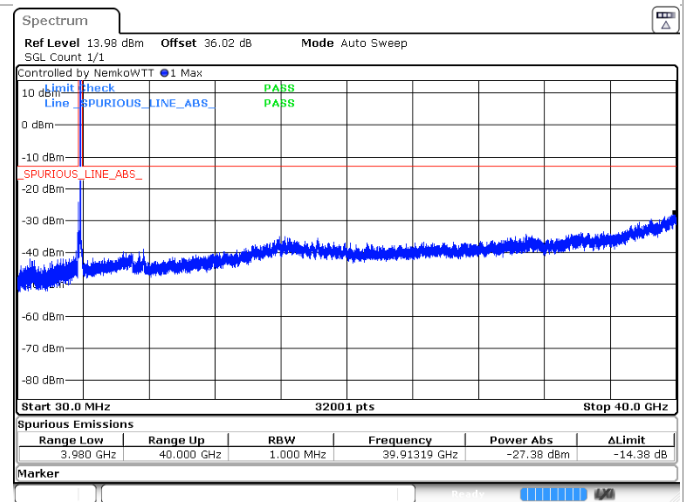
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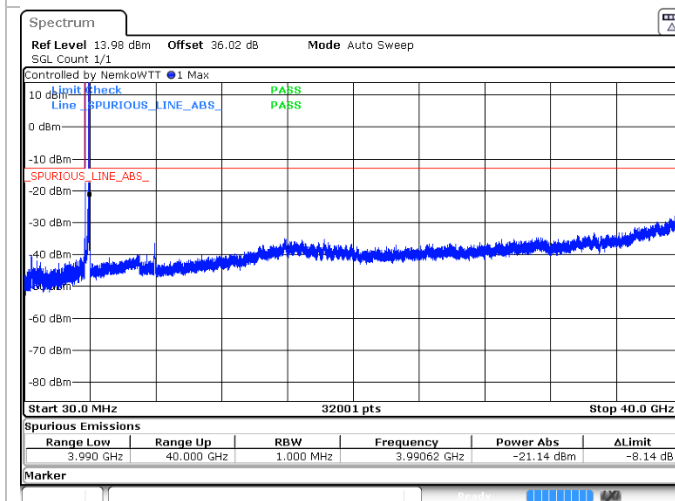
Spurious emissions, TX 3750 MHz, BW: 100MHz, MOD: 16QAM



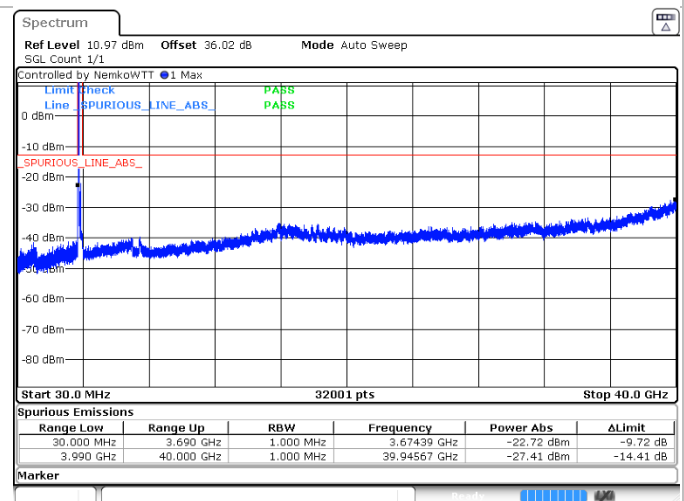
Spurious emissions, TX 3720 MHz, BW: 40MHz, MOD: 64QAM



Spurious emissions, TX 3840 MHz, BW: 40MHz, MOD: 64QAM



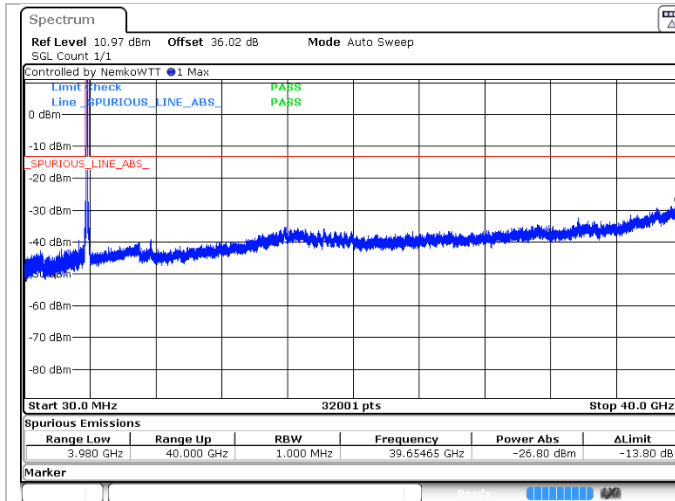
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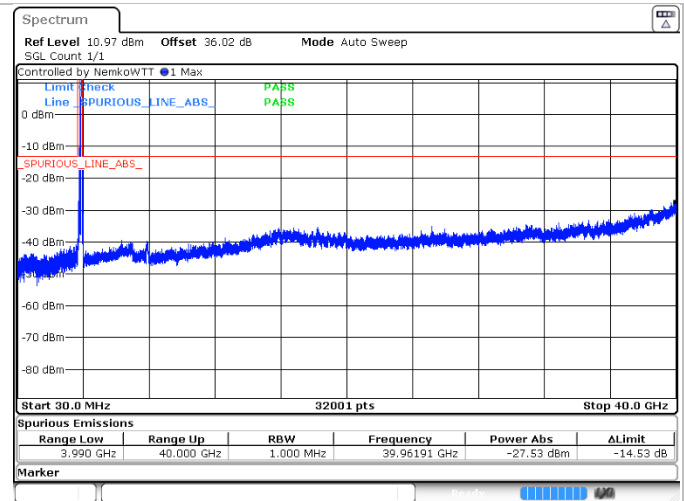
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Section 8
Test name
Specification

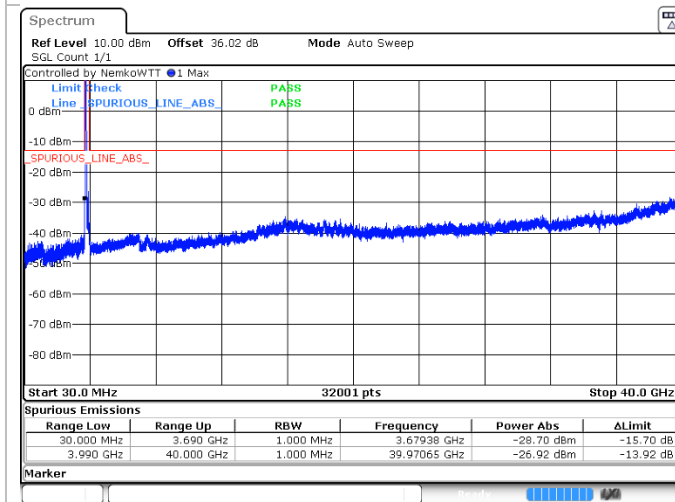
Testing data
FCC 27.53(l) Emission limits
FCC Part 27



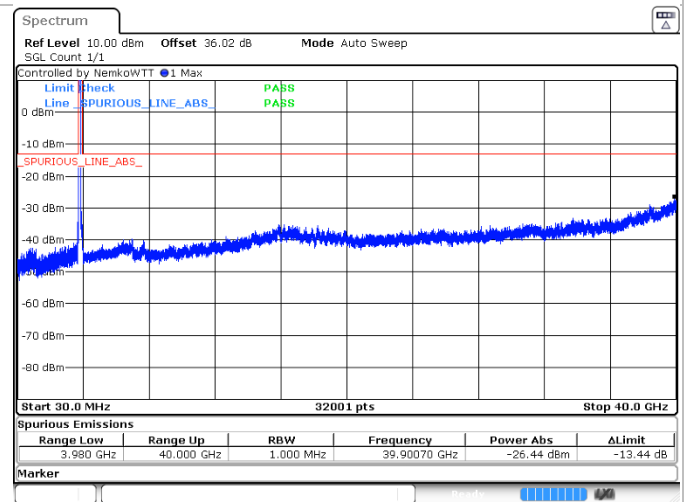
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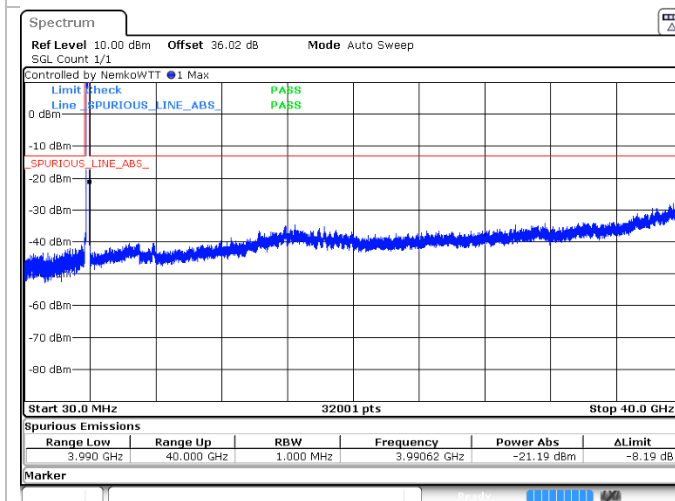
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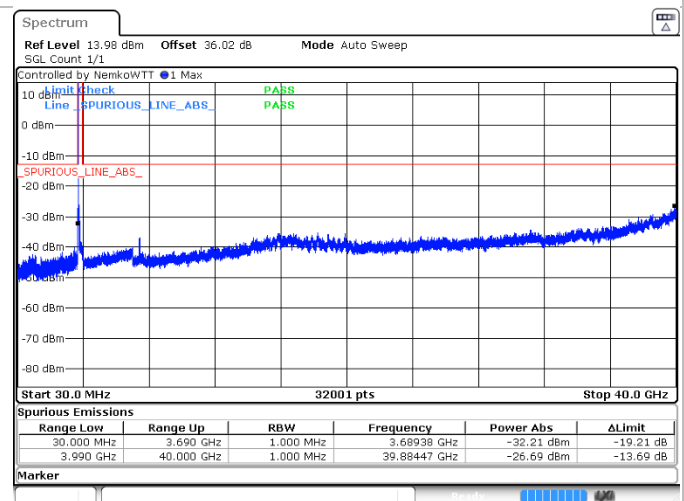
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Spurious emissions, TX 3840 MHz, BW: 100MHz, MOD: 64QAM



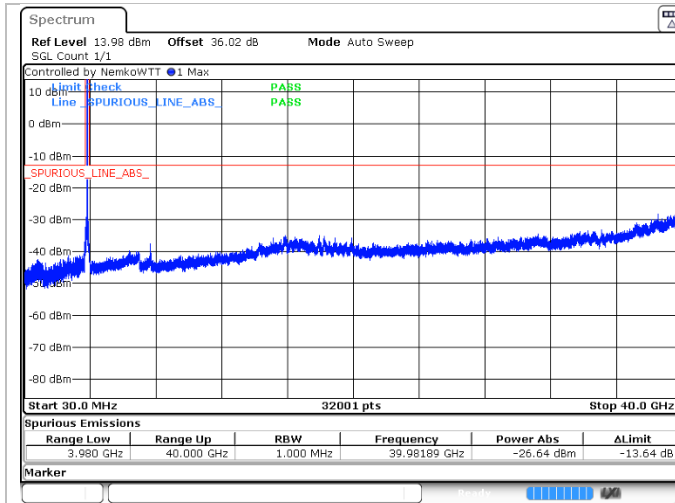
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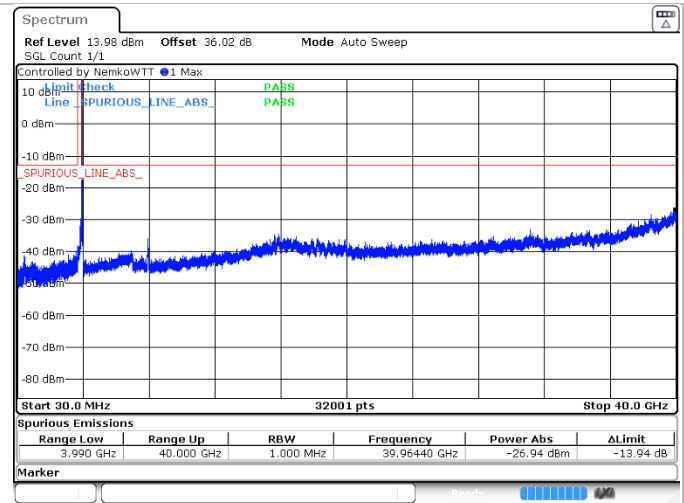
Spurious emissions, TX 3720 MHz, BW: 40MHz, MOD: 256QAM

Section 8
Test name
Specification

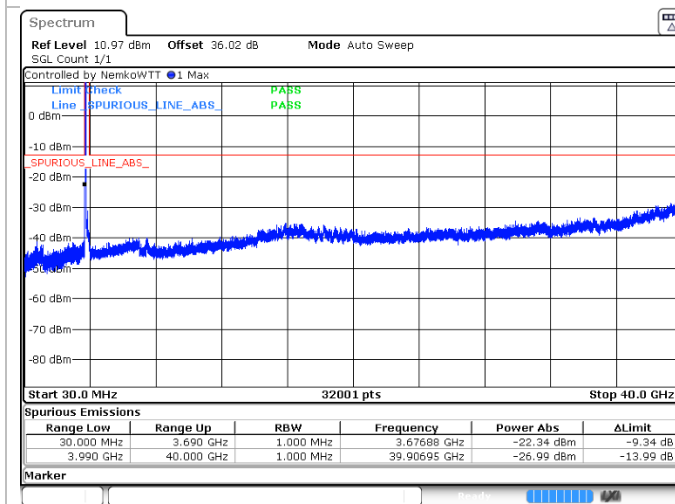
Testing data
FCC 27.53(l) Emission limits
FCC Part 27



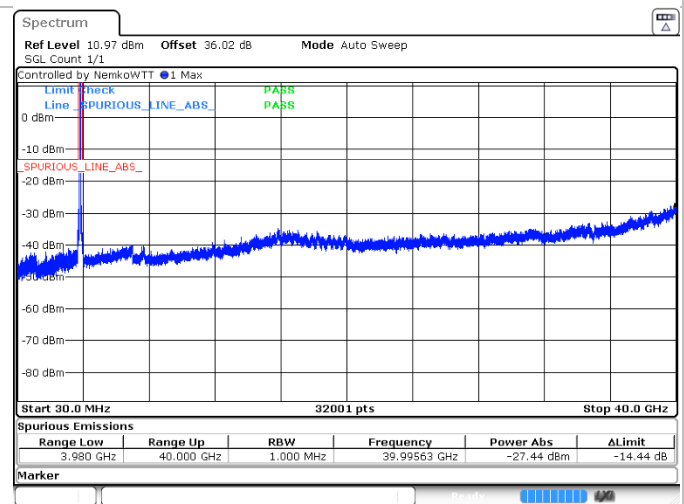
Spurious emissions, TX 3840 MHz, BW: 40MHz, MOD: 256QAM



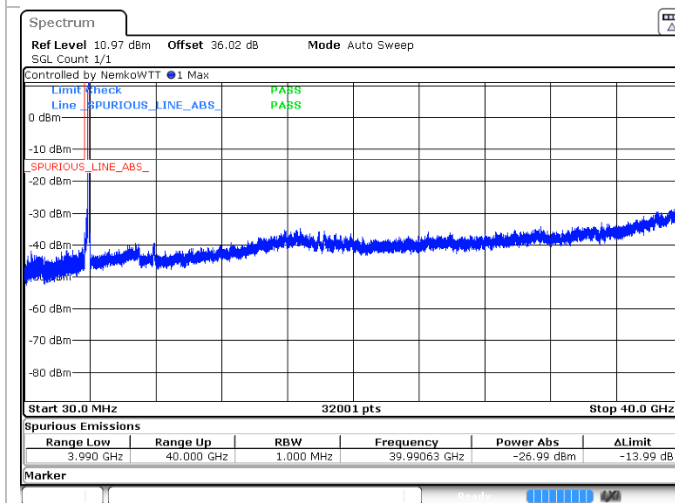
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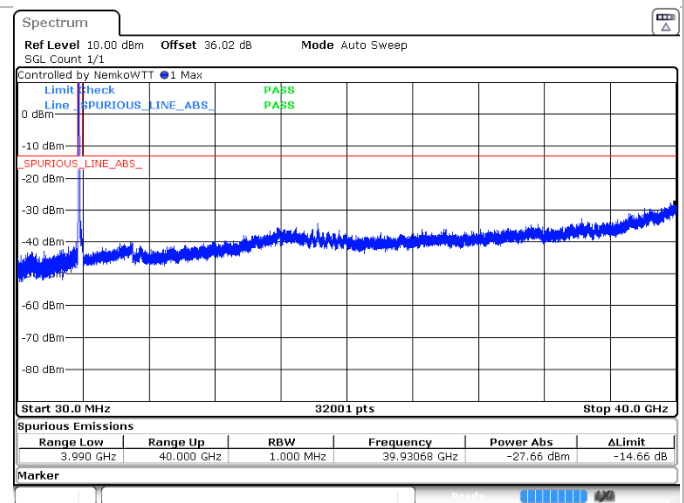
Spurious emissions, TX 3740 MHz, BW: 80MHz, MOD: 256QAM



Spurious emissions, TX 3840 MHz, BW: 80MHz, MOD: 256QAM



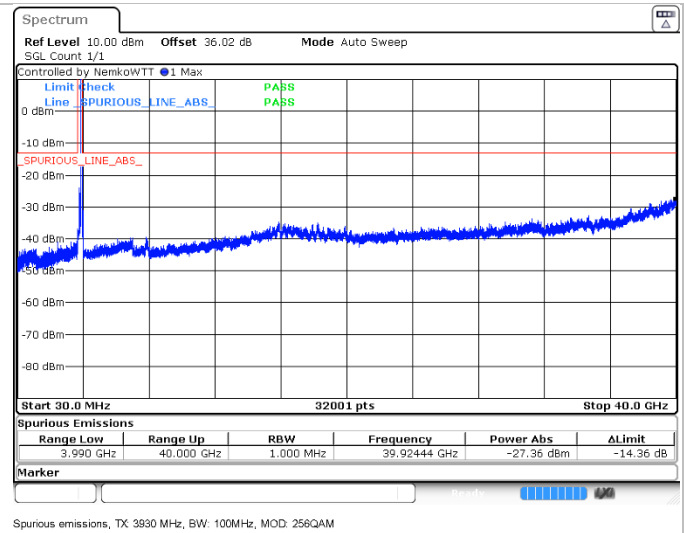
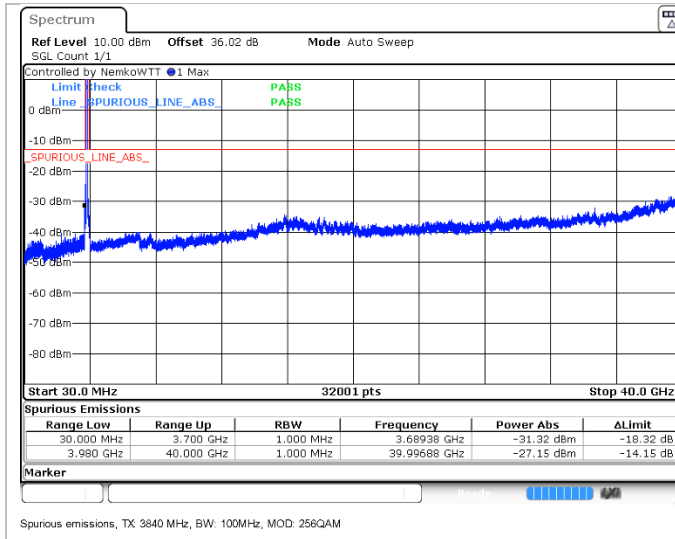
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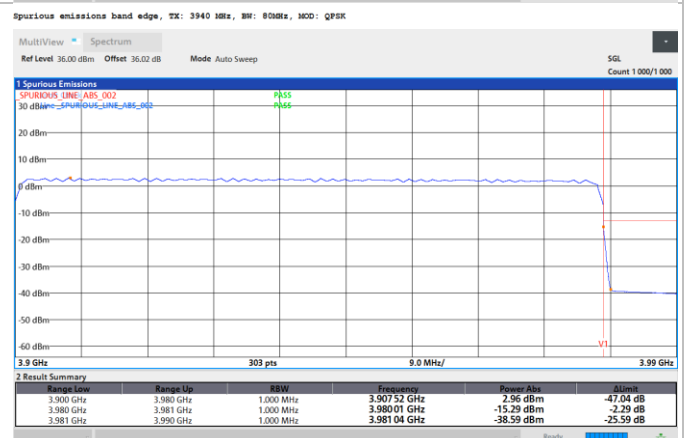
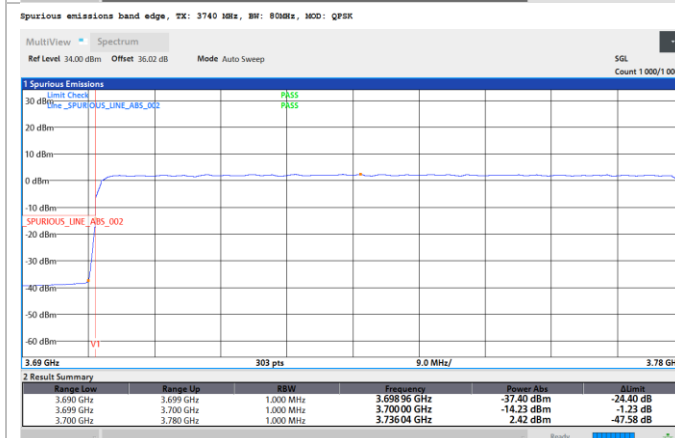
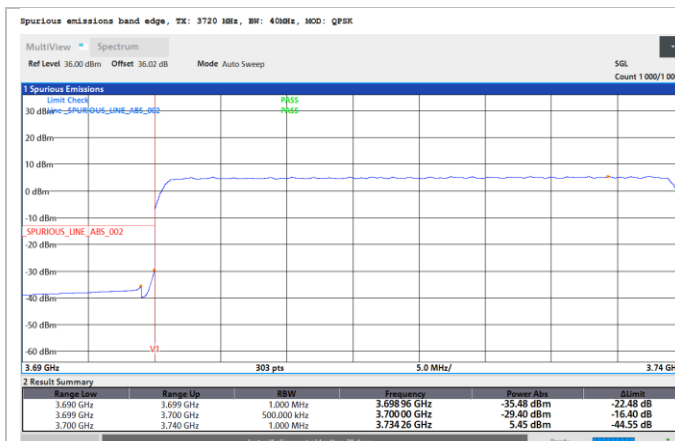
Spurious emissions, TX 3750 MHz, BW: 100MHz, MOD: 256QAM

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Band n77 – band edge



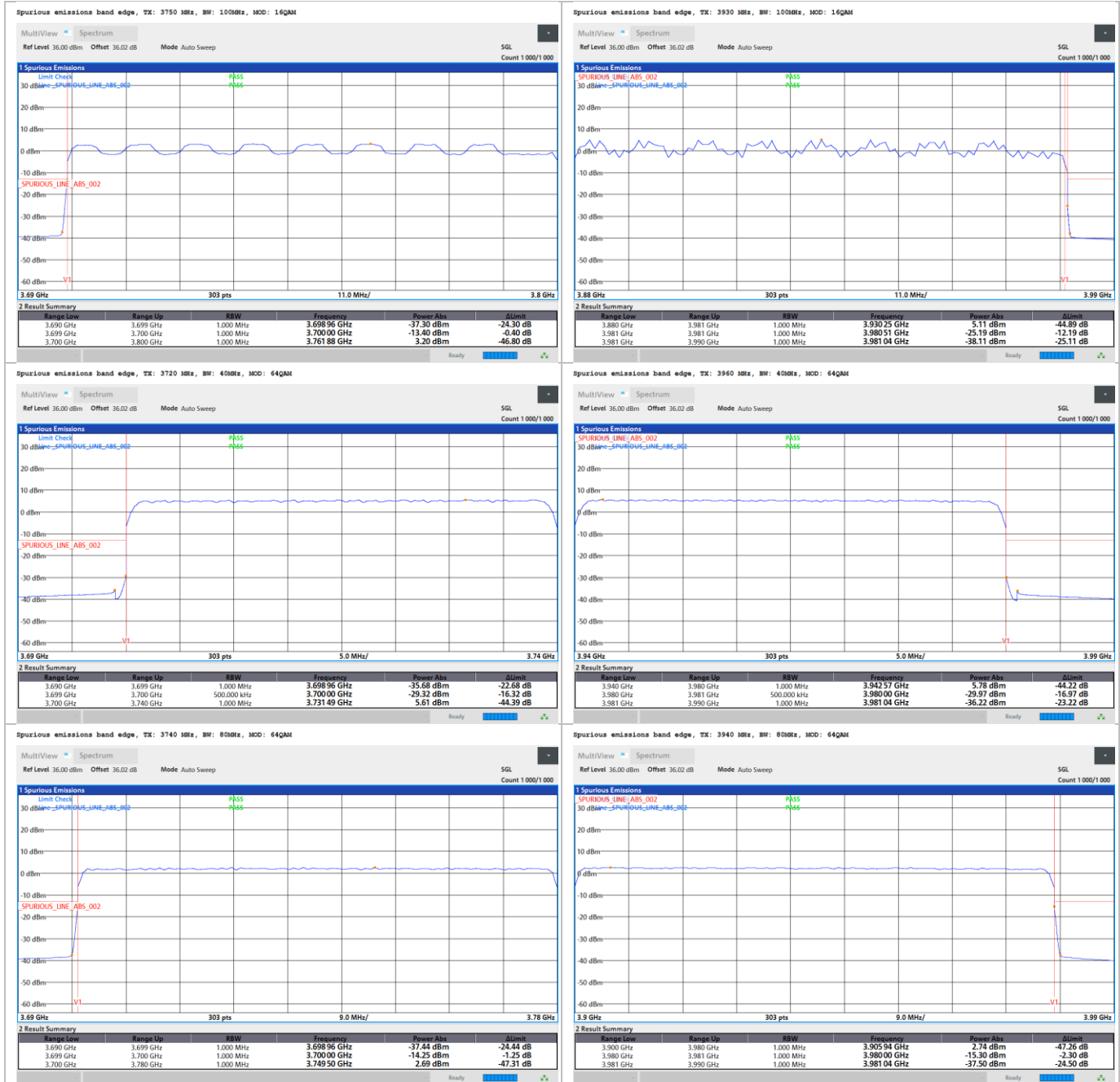
Section 8
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Specification

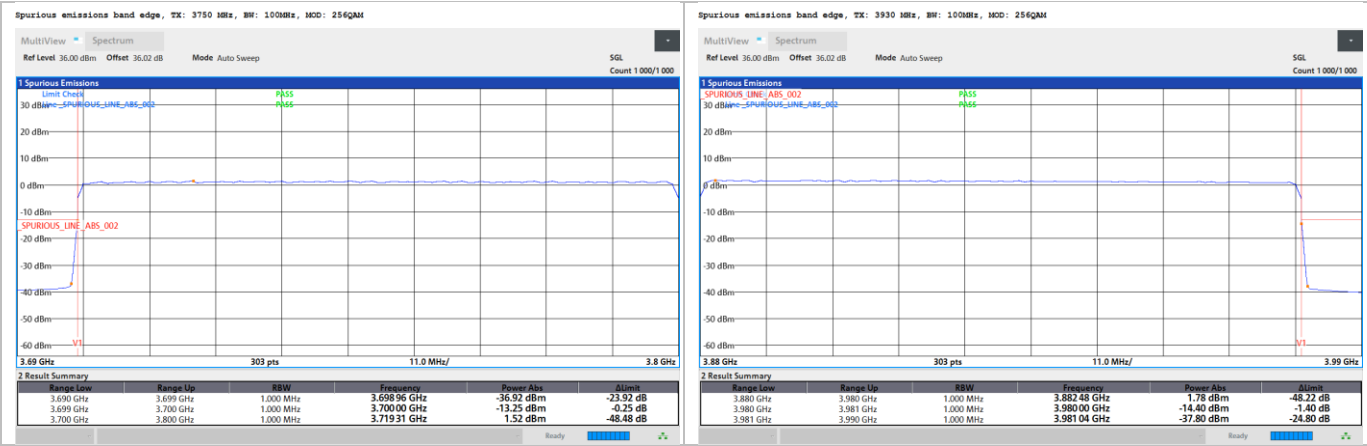
Testing data
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Specification

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Band n77 – radiated spurious emissions

40 MHz, high channel, 16 QAM

Full Spectrum

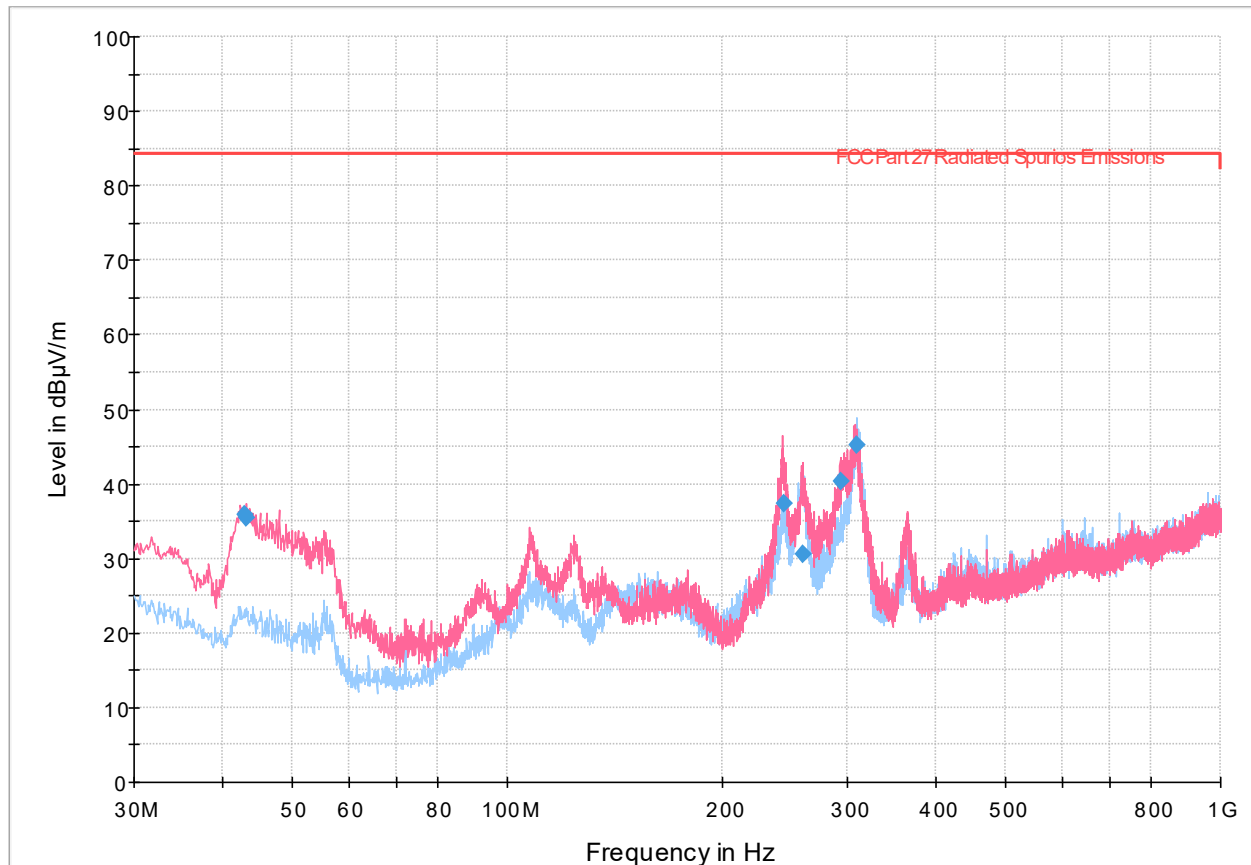


Figure 8.6-1: Radiated emissions spectral plot (30 MHz - 1 GHz)

Table 8.6-1: Radiated emissions results

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
42.879000	35.79	84.38	48.59	5000.0	120.000	100.0	V	10.0	17.5
43.135000	35.44	84.38	48.94	5000.0	120.000	107.0	V	356.0	17.3
244.012000	37.45	84.38	46.93	5000.0	120.000	100.0	V	20.0	19.5
260.050000	30.56	84.38	53.82	5000.0	120.000	110.0	V	78.0	21.8
294.024000	40.26	84.38	44.12	5000.0	120.000	114.0	V	56.0	21.0
308.846000	45.21	84.38	39.17	5000.0	120.000	138.0	H	43.0	21.3

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

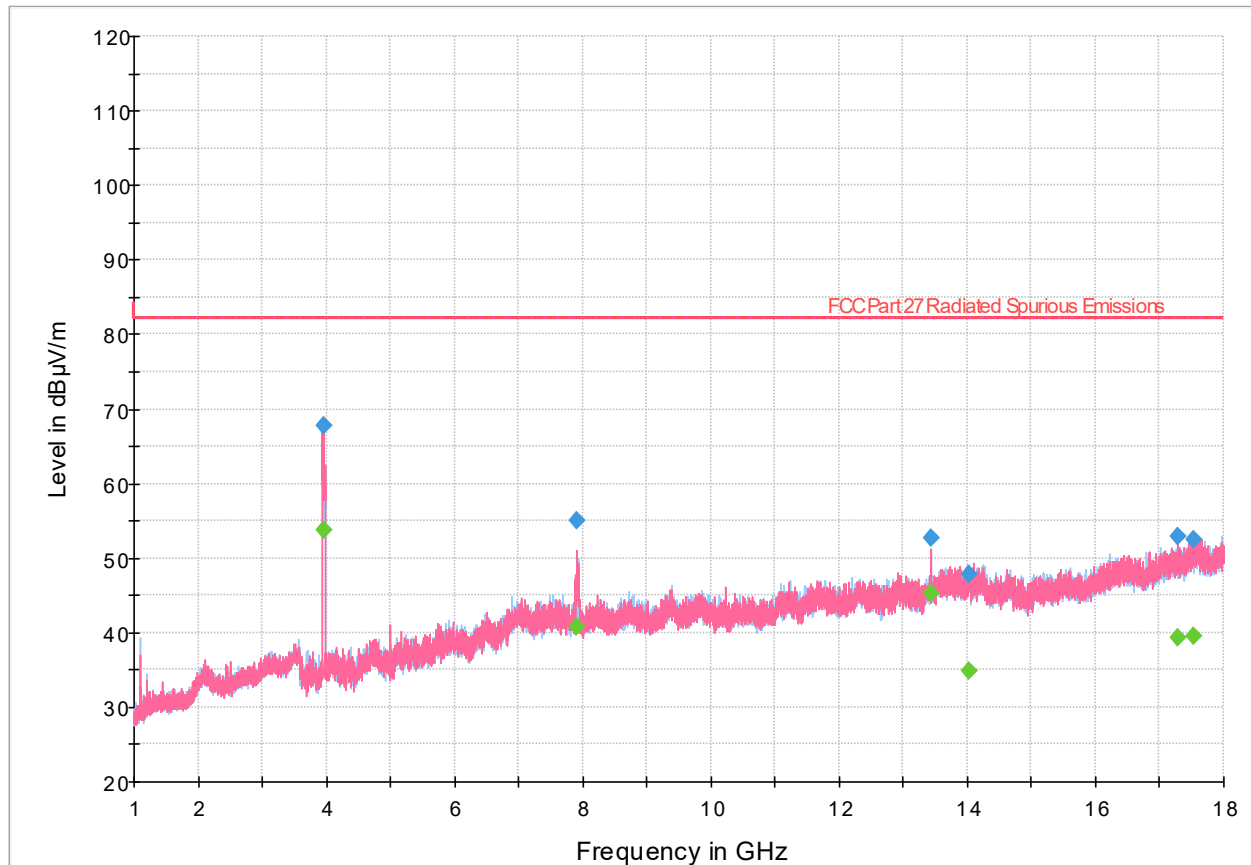


Figure 8.6-2: Radiated emissions spectral plot (1 GHz - 18 GHz)

Table 8.6-2: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
3954.544444										
3954.544444										
7919.400000	---	40.77	82.23	41.46	5000.0	1000.000	120.0	V	250.0	24.7
7919.400000	54.95	---	82.23	27.28	5000.0	1000.000	120.0	V	250.0	24.7
13439.822222	---	45.31	82.23	36.92	5000.0	1000.000	110.0	V	11.0	30.6
13439.822222	52.72	---	82.23	29.51	5000.0	1000.000	110.0	V	11.0	30.6
14025.277778	47.77	---	82.23	34.46	5000.0	1000.000	299.0	H	135.0	31.1
14025.277778	---	34.88	82.23	47.35	5000.0	1000.000	299.0	H	135.0	31.1
17282.544444	---	39.25	82.23	42.98	5000.0	1000.000	316.0	V	353.0	36.0
17282.544444	52.85	---	82.23	29.38	5000.0	1000.000	316.0	V	353.0	36.0
17527.811111	52.50	---	82.23	29.73	5000.0	1000.000	154.0	H	146.0	36.4
17527.811111	---	39.59	82.23	42.64	5000.0	1000.000	154.0	H	146.0	36.4

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

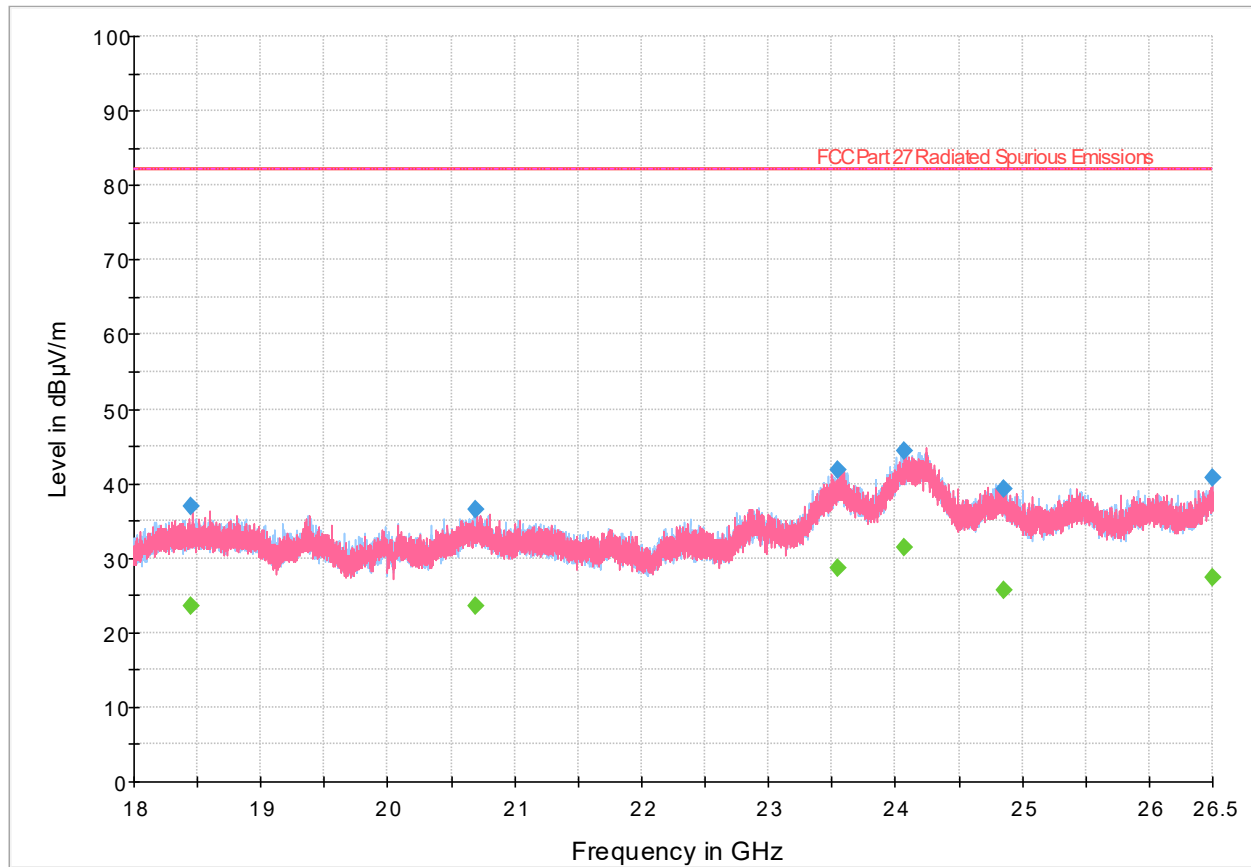


Figure 8.6-3: Radiated emissions spectral plot (18 GHz - 26.5 GHz)

Table 8.6-3: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
18452.631250	---	23.51	82.23	58.72	5000.0	1000.000	371.0	V	70.0	15.5
18452.631250	36.97	---	82.23	45.26	5000.0	1000.000	371.0	V	70.0	15.5
20692.325000	---	23.64	82.23	58.59	5000.0	1000.000	107.0	H	35.0	18.2
20692.325000	36.52	---	82.23	45.71	5000.0	1000.000	107.0	H	35.0	18.2
23540.550000	41.80	---	82.23	40.43	5000.0	1000.000	397.0	H	43.0	23.5
23540.550000	---	28.61	82.23	53.62	5000.0	1000.000	397.0	H	43.0	23.5
24067.081250	---	31.44	82.23	50.79	5000.0	1000.000	360.0	V	327.0	27.5
24067.081250	44.41	---	82.23	37.82	5000.0	1000.000	360.0	V	327.0	27.5
24852.387500	39.23	---	82.23	43.00	5000.0	1000.000	124.0	H	356.0	22.3
24852.387500	---	25.72	82.23	56.51	5000.0	1000.000	124.0	H	356.0	22.3
26499.400000	---	27.40	82.23	54.83	5000.0	1000.000	323.0	H	179.0	23.4
26499.400000	40.66	---	82.23	41.57	5000.0	1000.000	323.0	H	179.0	23.4

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

Full Spectrum

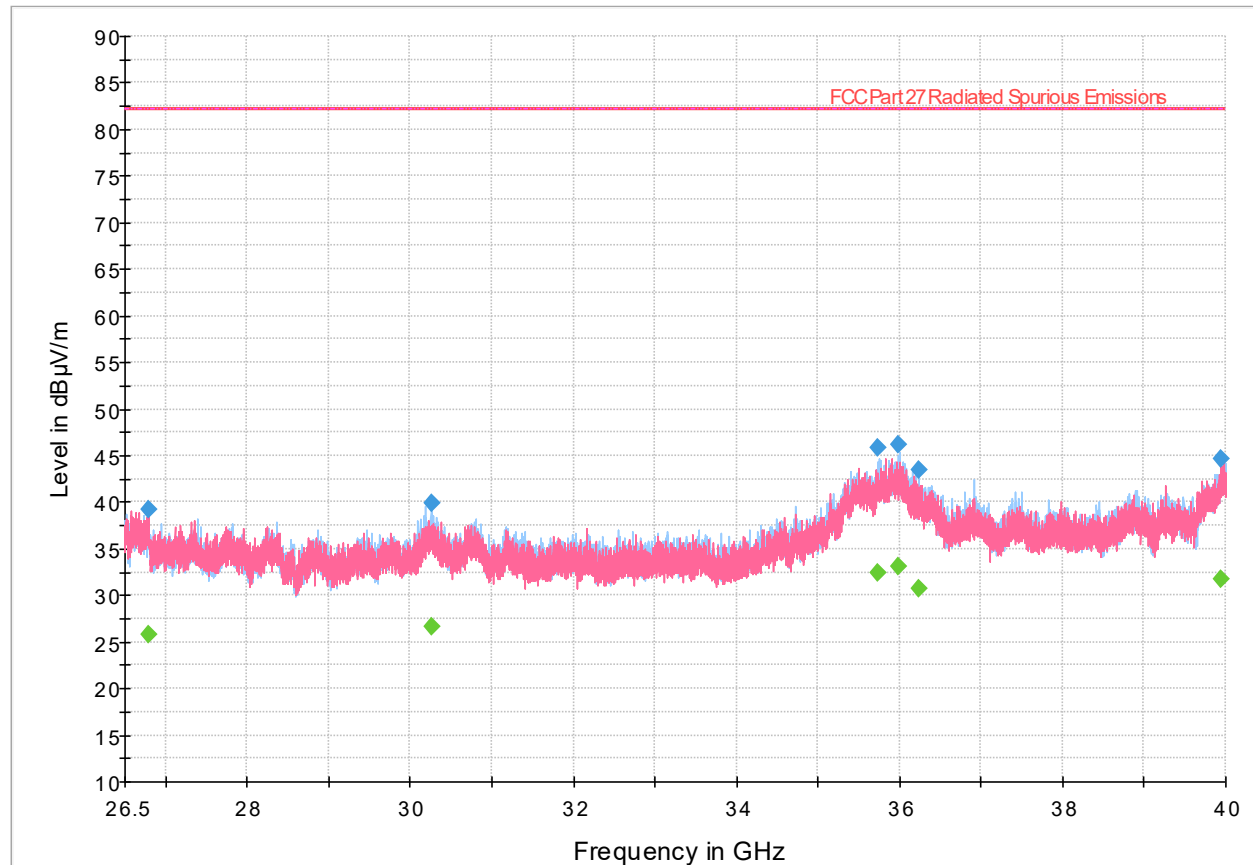


Figure 8.6-4: Radiated emissions spectral plot (26.5 GHz - 40 GHz)

Table 8.6-4: Radiated emissions results

Frequency (MHz)	MaxPeak (dBµV/m)	CAverage (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
26796.043750	39.13	---	82.23	43.10	5000.0	1000.000	125.0	V	49.0	10.0
26796.043750	---	25.84	82.23	56.39	5000.0	1000.000	125.0	V	49.0	10.0
30272.500000	39.96	---	82.23	42.27	5000.0	1000.000	125.0	H	21.0	12.0
30272.500000	---	26.57	82.23	55.66	5000.0	1000.000	125.0	H	21.0	12.0
35728.375000	---	32.34	82.23	49.89	5000.0	1000.000	125.0	H	232.0	20.4
35728.375000	45.91	---	82.23	36.32	5000.0	1000.000	125.0	H	232.0	20.4
35987.743750	---	33.04	82.23	49.19	5000.0	1000.000	175.0	H	92.0	21.0
35987.743750	46.19	---	82.23	36.04	5000.0	1000.000	175.0	H	92.0	21.0
36238.956250	---	30.73	82.23	51.50	5000.0	1000.000	125.0	H	263.0	18.9
36238.956250	43.54	---	82.23	38.69	5000.0	1000.000	125.0	H	263.0	18.9
39939.718750	---	31.74	82.23	50.49	5000.0	1000.000	100.0	V	30.0	20.2
39939.718750	44.68	---	82.23	37.55	5000.0	1000.000	100.0	V	30.0	20.2

Notes: ¹ Field strength (dB V/m) = receiver/spectrum analyzer value (dB V) + correction factor (dB)

² Correction factors = antenna factor ACF (dB) + cable loss (dB)

³ Emissions that were continuously present for a minimum of 1 second and occurred more than once for every 15 seconds observation period were considered valid emissions. The maximum value of valid emissions has been recorded.

8.7 FCC 27.54 Frequency Stability

8.7.1 Definitions and limits

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

8.7.2 Test summary

Test date	December 1, 2023	Temperature	3 °C
Test engineer	Chenhao Ma Wireless technician	Air pressure	1003 mbar
Verdict	Pass	Relative humidity	58%

8.7.3 Observations, settings and special notes

The EUT was configured to continuously transmit an modulated signal. The frequency measurement was performed using the marker->signal count functionality of the spectrum analyzer. The only requirement from Part 27 is that the carrier stays within the allocated band.

Test method: ANSI C63.26 Section 5.6.

8.7.4 Test data

Band n77:

Table 8.7-1: Frequency stability results, band n77

Test conditions	Frequency, MHz
+50 °C, Nominal	3840.000
+40 °C, Nominal	3840.000
+30 °C, Nominal	3840.000
+20 °C, 138 VAC	3840.000
+20 °C, Nominal	3840.000
+20 °C, 102 VAC	3840.000
+10 °C, Nominal	3840.000
0 °C, Nominal	3840.000
-10 °C, Nominal	3840.000
-20 °C, Nominal	3840.000

Section 9. Block diagrams of test setups

9.1 Radiated emissions set-up

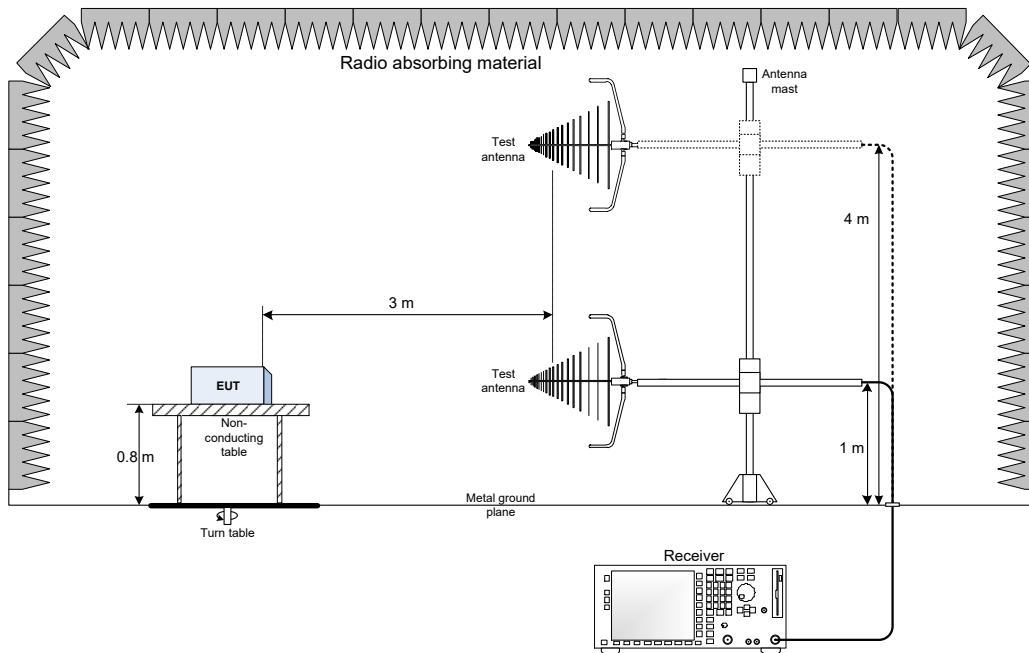


Figure 9.1-1: Below 1 GHz setup

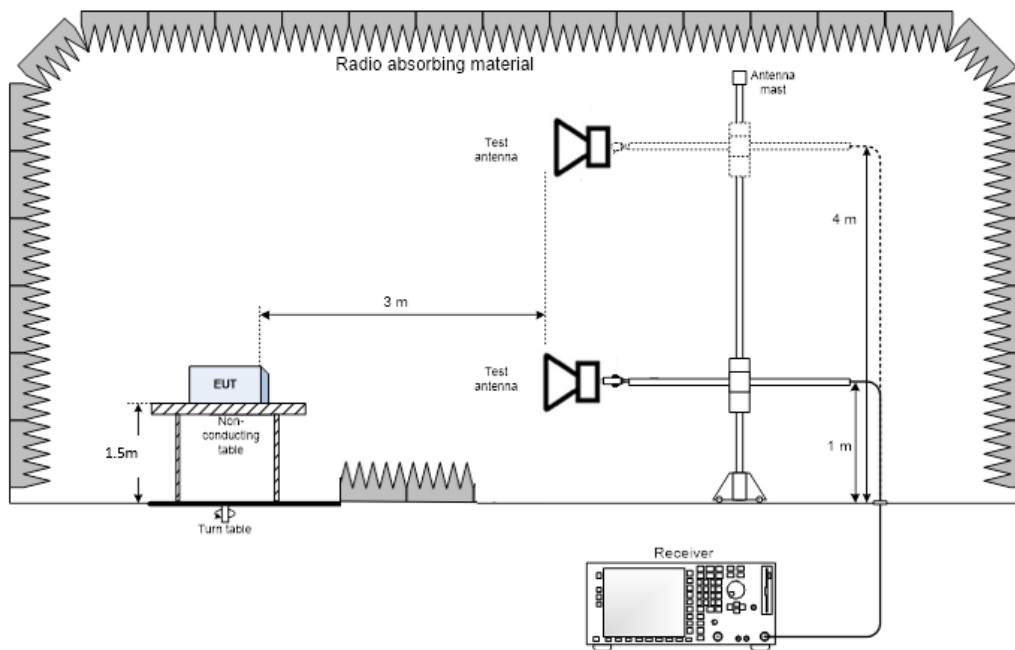


Figure 9.1-2: Above 1GHz setup

End of report