

WRAU-2120

Spurious Emission Corrections for Antenna and Transmission Line Components:

The WFA-701X Antenna Flatplate radiator is a required part of the radar system along with the DRV-2120 Antenna Pedestal and transmission line components. All conducted emissions (desired and spurious) must pass through the antenna before being radiated into space.

Each of these elements provides attenuation to spurious emissions radiated into space. The following paragraphs describe these attenuation factors. These factors will then be applied to the spurious emission levels.

Flatplate Antenna Attenuation for Spurious Frequencies:

The WFA-701X Flatplate Antenna is a tuned waveguide structure with 34.5 dB of gain at the center frequency of 9333 MHz. The WFA-701X has substantial attenuation at frequencies removed from the center frequency.

Antenna gain measurements were made on the flatplate at spurious frequencies up to 18.666 GHz. The highest response was 12.49 dB at 11.666 GHz. Other frequencies were significantly lower.

Therefore, the attenuation for spurious outputs due to the antenna response is:

$$\text{Attenuation Due To Antenna Response} = 34.5 \text{ dB} - 12.5 \text{ dB} = 22 \text{ dB}.$$

Other attenuating factors for spurious outputs include mismatch loss into the antenna and loss through the antenna pedestal transmission line and rotary joints. These losses will not be included here but serve to add extra margin to the 22 dB attenuation from the flatplate.

The Antenna Correction Factor of 22 dB will be applied to all spurious emissions recognizing that this is a conservative number and that the actual attenuation is larger in most cases.

60 dBc Limit:

For reference, the spurious emissions will be compared to a 40 dBc limit and a 60 dBc limit.

The limit for a 60 dBc attenuation is:

$$\text{Absolute Limit (60 dBc)} = P_{tx\text{-peak}} - 60 = 49.61 \text{ dBm} - 60 = -10.39 \text{ dBm}$$

Table F-1: Additional Test Limit Used for 1.65 GHz Spurious Emissions Tests

Component	Manufacturer/Model Number	Specific Identification
Antenna	HP P7113	WFA-701X
Antenna Pedestal	Rockwell Collins E-Grouping	DRV-2120
Waveguide	CMT P7121-B	WFA-701X
Waveguide to Cable	HP P7113	WFA-701X
Component of 400 GHz		WFA-701X

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Procedure:

The spurious emissions at the antenna terminal of the WRAU-2120 were measured using test equipment connected to the Receiver/Transmitter antenna waveguide port on the rear of the R/T mount. The equipment used for the Spurious Emissions at the Antenna Terminal test is shown in Table F-13 through Table F-17.

Table F-13. Equipment Used for Spurious Emissions Tests

Equipment	Manufacturer/Model Number	Specific Identification
Receiver/Transmitter Module	Rockwell Collins RTM-2100 (822-2127-001)	S/N 2GJ4L
Antenna Drive Assembly	Rockwell Collins DRV-2120 (822-2131-001)	S/N 05
Test Harness	Rockwell Collins Fiber/Power Test Harness	827-3389-121
Variable DC Power Source	Sorensen DCR40-13B DC Power Supply	SN 0501 460-0047-261
Personal Computer	IBM Compatible with National Instruments GPIB Interface and Agilent E4444A Benchlink Software	Gateway 2000 P5-120 SN 4250149
Personal Computer	IBM Compatible with WRAU Controller Software	Dell OptiPlex GX260 CRP09003
Spectrum Analyzer	Agilent 8564EC (9 kHz to 40 GHz)	SN 4111A01362 460-0132-667

Table F-14. Additional Test Equipment Used for X Band (8.2 – 12.4 GHz) Spurious Emissions Tests

Equipment	Manufacturer/Model Number	Specific Identification
Directional Coupler (20dB)	HP X752D	SN 622 460-0132-809
Waveguide Termination	CMT LPT90-1B	SN 970005-001 460-0133-413 Component of 460-0132-809
Waveguide to Coax Adapter	HP X281C	SN 3032A-06660 460-0210-312 Component of 460-0132-809
Attenuator (20 dB)	Weinschel WA1-20	460-0203-439 Component of 460-0132-809

Table F-15. Additional Test Equipment Used for P band (Ku) (12.4 – 18.0 GHz) Spurious Emissions Tests

Equipment	Manufacturer/Model Number	Specific Identification
Directional Coupler (20dB)	HP P752D	SN 359 460-0132-825
Waveguide Taper (X to P Band)	Space Machine & Engineering	460-0133-402 Component of 460-0132-825
Waveguide Termination	CMT LPT62-1B	SN 970005-002 460-0133-414 Component of 460-0132-825
Waveguide to Coax Adapter	HP P281B	460-0133-418 Component of 460-0132-825

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Table F-16. Additional Test Equipment Used for K Band (18.0 – 26.5 GHz) Spurious Emissions Tests

Equipment	Manufacturer/Model Number	Specific Identification
Directional Coupler (20dB)	HP K752D	SN 177 460-0132-826
Waveguide Taper (X to K Band)	Space Machine & Engineering	460-0133-404 Component of 460-0132-826
Waveguide Termination	CMT LPT42-1B	SN 970005-003 460-0133-416 Component of 460-0132-826
Waveguide to Coax Adapter	HP K281C	SN3032A-09068 460-0133-412 Component of 460-0132-826

Table F-17. Additional Test Equipment Used for R Band (Ka) (26.5 – 40.0 GHz) Spurious Emissions Tests

Equipment	Manufacturer/Model Number	Specific Identification
Directional Coupler (20dB)	HP R752D	SN 463 460-0132-827
Waveguide Taper (X to R Band)	Space Machine & Engineering	460-0133-406 Component of 460-0132-827
Waveguide Termination	CMT LPT28-1B	SN 970005-004 460-0133-415 Component of 460-0132-827
Waveguide to Coax Adapter	HP R281A	SN 02136 460-0133-417 Component of 460-0132-827

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Setup:

A functional block diagram of the equipment setup for the X Band (8.2 to 12.4 GHz) Spurious Emissions at Antenna Terminal test is shown in Figure F-40. The actual test equipment setup is shown in Figure F-41.

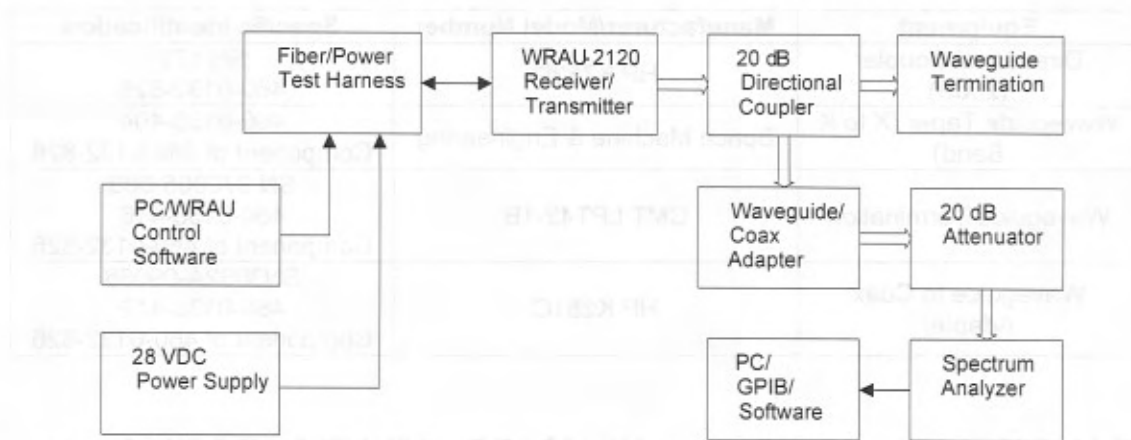


Figure F-40. Spurious Emissions of Antenna Terminal Test Setup (8.2 – 12.4 GHz)

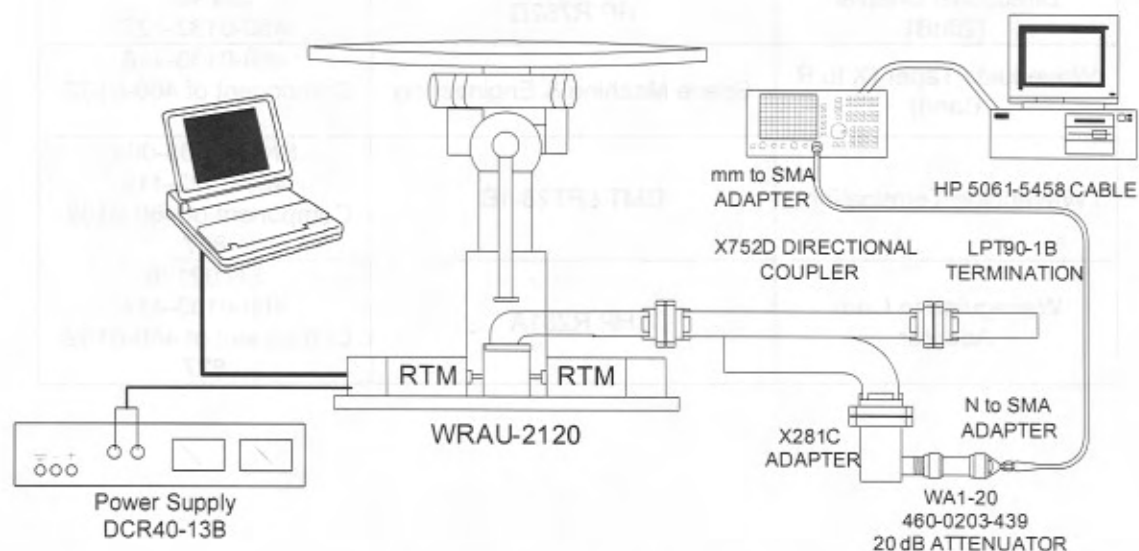


Figure F-41. Test Equipment Setup for Spurious Emissions at Antenna Terminal Tests (8.2 – 12.4 GHz)

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A functional block diagram of the equipment setup for the P Band (Ku) (12.4 to 18.0 GHz), K Band (18.0 to 26.5 GHz), and R Band (Ka) (26.5 to 40.0 GHz) Spurious Emissions at Antenna Terminal Tests is shown in Figure F-42. The actual test equipment setup is shown in Figure F-43.

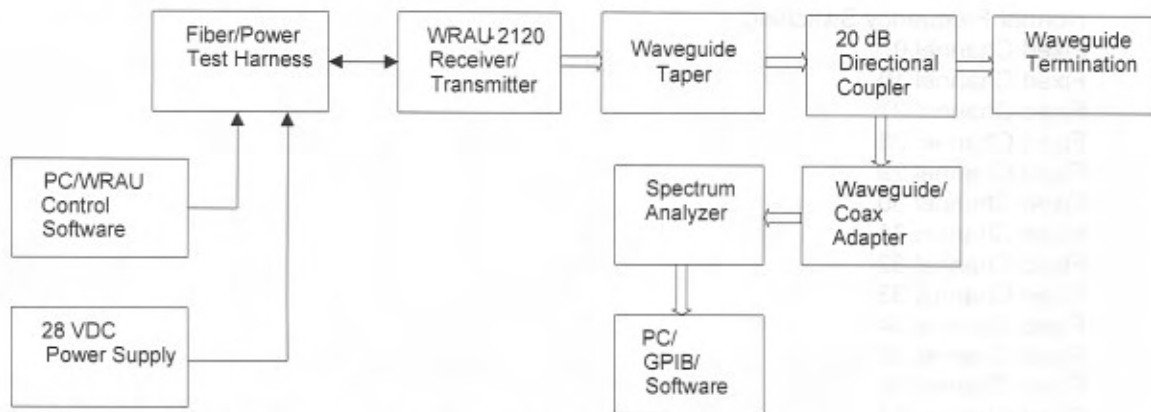


Figure F-42. Spurious Emissions at Antenna Terminal Test Setup (12.4 – 40 GHz)

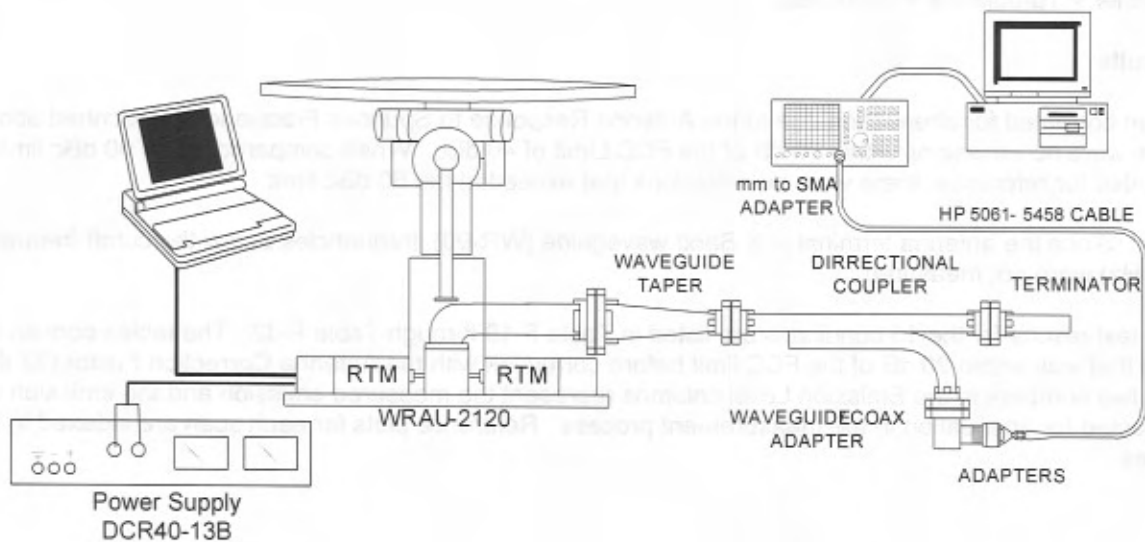


Figure F-43. Equipment Setup for Spurious Emissions at Antenna Terminal Tests (12.4 – 40 GHz)

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Measurements:

Spurious Antenna Emission Test data was taken for 15 conditions:

Normal Frequency Switching

- Fixed Channel 0
- Fixed Channel 10
- Fixed Channel 27
- Fixed Channel 28
- Fixed Channel 29
- Fixed Channel 30
- Fixed Channel 31
- Fixed Channel 32
- Fixed Channel 33
- Fixed Channel 34
- Fixed Channel 35
- Fixed Channel 36
- Fixed Channel 50
- Fixed Channel 63

In each case, the radar was operating at the maximum operational mode:

Weather + Turbulence + Windshear.

Results:

When corrected for attenuation due to the Antenna Response to Spurious Frequencies described above, there were no emissions within 20 dB of the FCC Limit of 40 dBc. When compared to the 60 dBc limit included for reference, there were no emissions that exceeded the 60 dBc limit.

Note: Since the antenna terminal is X-Band waveguide (WR-90), frequencies below the cutoff frequency (7 GHz) were not measured.

The test results for the 15 conditions are listed in Table F-18 through Table F-32. The tables contain all data that was within 20 dB of the FCC limit before correction with the Antenna Correction Factor (22 dB). The two numbers in the Emission Level columns represent the measured emission and the emission level corrected for attenuation in the measurement process. Reference plots for each scan are indexed in the tables.

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Table F-18. Conducted Spurious Emissions – Normal Mode

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs 40 dBc Limit	Margin (dB) vs 60 dBc Limit	Reference Figure
8.2 to 12.4 GHz	9.271	-45.33 -5.33	-27.33	+9.61	-10.39	+36.94	+16.94	Figure F-44
12.4 to 18.0 GHz	16.6191	-68.17 -48.17	-70.17	+9.61	-10.39	+79.78	+59.78	Figure F-45
18.0 to 26.5 GHz	18.737	-49.67 -29.67	-51.67	+9.61	-10.39	+61.28	+41.28	Figure F-46
26.5 to 40.0 GHz	37.03	-63.50 -43.50	-65.50	+9.61	-10.39	+75.11	+55.11	Figure F-47

Table F-19. Conducted Spurious Emissions – Channel 0

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz*	9.222	-50.17 -10.17	-32.17	+9.61	-10.39	+41.78	+10.69	Figure F-48
12.4 to 18.0 GHz	12.540	-68.33 -48.33	-70.33	+9.61	-10.39	+79.94	+59.94	Figure F-49
18.0 to 26.5 GHz	18.652	-52.50 -32.50	-54.50	+9.61	-10.39	+64.11	+44.11	Figure F-50
26.5 to 40.0 GHz	27.96	-63.17 -43.17	-65.17	+9.61	-10.39	+74.78	+54.78	Figure F-51

Table F-20. Conducted Spurious Emissions – Channel 10

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.243	-50.00 -10.00	-32.00	+9.61	-10.39	+41.61	+21.61	Figure F-52
12.4 to 18.0 GHz	12.680	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+59.61	Figure F-53
18.0 to 26.5 GHz	18.680	-53.00 -33.00	-55.00	+9.61	-10.39	+64.61	+44.61	Figure F-54
26.5 to 40.0 GHz	27.99	-62.17 -42.17	-64.17	+9.61	-10.39	+73.78	+53.78	Figure F-55

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Table F-21. Conducted Spurious Emissions – Channel 27

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.271	-45.17 -5.17	-27.17	+9.61	-10.39	+36.78	+16.78	Figure F-56
12.4 to 18.0 GHz	13.165	-68.33 -48.33	-70.33	+9.61	-10.39	+79.94	+59.69	Figure F-57
18.0 to 26.5 GHz	18.723	-51.00 -31.00	-53.00	+9.61	-10.39	+62.61	+42.61	Figure F-58
26.5 to 40.0 GHz	36.63	-61.83 -41.83	-63.83	+9.61	-10.39	+73.44	+53.44	Figure F-59

Table F-22. Conducted Spurious Emissions – Channel 28

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.271	-45.67 -5.67	-27.67	+9.61	-10.39	+37.28	+17.28	Figure F-60
12.4 to 18.0 GHz	13.203	-68.67 -48.67	-70.67	+9.61	-10.39	+80.28	+60.28	Figure F-61
18.0 to 26.5 GHz	18.723	-50.83 -30.83	-52.83	+9.61	-10.39	+62.44	+42.44	Figure F-62
26.5 to 40.0 GHz	36.42	-62.33 -42.33	-64.33	+9.61	-10.39	+73.94	+53.94	Figure F-63

Table F-23. Conducted Spurious Emissions – Channel 29

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.271	-46.00 -6.00	-28.00	+9.61	-10.39	+37.61	+17.61	Figure F-64
12.4 to 18.0 GHz	12.680	-68.67 -48.67	-70.67	+9.61	-10.39	+80.28	+60.28	Figure F-65
18.0 to 26.5 GHz	18.723	-50.17 -30.17	-52.17	+9.61	-10.39	+61.78	+41.78	Figure F-66
26.5 to 40.0 GHz	36.24	-62.17 -42.17	-64.17	+9.61	-10.39	+73.78	+53.78	Figure F-67

Table F-24. Conducted Spurious Emissions – Channel 30

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.271	-45.83 -5.83	-27.83	+9.61	-10.39	+37.44	+17.44	Figure F-68
12.4 to 18.0 GHz	12.596	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+60.36	Figure F-69
18.0 to 26.5 GHz	18.723	-50.00 -30.00	-52.00	+9.61	-10.39	+61.61	+41.61	Figure F-70
26.5 to 40.0 GHz	36.87	-62.00 -42.00	-64.00	+9.61	-10.39	+73.61	+53.61	Figure F-71

Table F-25. Conducted Spurious Emissions – Channel 31

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.278	-46.67 -6.67	-28.67	+9.61	-10.39	+38.28	+18.28	Figure F-72
12.4 to 18.0 GHz	13.212	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+59.61	Figure F-73
18.0 to 26.5 GHz	18.723	-52.17 -32.17	-54.17	+9.61	-10.39	+63.78	+30.19	Figure F-74
26.5 to 40.0 GHz	36.94	-62.33 -42.33	-64.33	+9.61	-10.39	+73.94	+53.94	Figure F-75

Table F-26. Conducted Spurious Emissions – Channel 32

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.278	-45.67 -5.67	-27.67	+9.61	-10.39	+37.28	+17.28	Figure F-76
12.4 to 18.0 GHz	13.371	-68.33 -48.33	-70.33	+9.61	-10.39	+79.94	+59.94	Figure F-77
18.0 to 26.5 GHz	18.737	-50.17 -30.17	-52.17	+9.61	-10.39	+61.78	+41.78	Figure F-78
26.5 to 40.0 GHz	36.67	-61.83 -41.83	-63.83	+9.61	-10.39	+73.44	+53.44	Figure F-79

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Table F-27. Conducted Spurious Emissions – Channel 33

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.278	-46.50 -6.50	-28.50	+9.61	-10.39	+38.11	+18.11	Figure F-80
12.4 to 18.0 GHz	12.559	-67.83 -47.83	-69.83	+9.61	-10.39	+79.44	+59.44	Figure F-81
18.0 to 26.5 GHz	18.737	-49.33 -29.33	-51.33	+9.61	-10.39	+60.94	+40.94	Figure F-82
26.5 to 40.0 GHz	36.56	-61.67 -41.67	-63.67	+9.61	-10.39	+73.28	+53.28	Figure F-83

Table F-28. Conducted Spurious Emissions – Channel 34

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.278	-45.50 -5.50	-27.50	+9.61	-10.39	+37.11	+17.11	Figure F-84
12.4 to 18.0 GHz	13.380	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+59.52	Figure F-85
18.0 to 26.5 GHz	18.737	-49.67 -29.67	-51.67	+9.61	-10.39	+61.28	+41.28	Figure F-86
26.5 to 40.0 GHz	36.51	-61.83 -41.83	-63.83	+9.61	-10.39	+73.44	+53.44	Figure F-87

Table F-29. Conducted Spurious Emissions – Channel 35

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.285	-46.33 -6.33	-28.33	+9.61	-10.39	+37.94	+17.94	Figure F-88
12.4 to 18.0 GHz	13.399	-68.33 -48.33	-70.33	+9.61	-10.39	+79.94	+59.94	Figure F-89
18.0 to 26.5 GHz	18.737	-48.17 -28.17	-50.17	+9.61	-10.39	+59.78	+39.78	Figure F-90
26.5 to 40.0 GHz	36.72	-61.50 -41.50	-63.50	+9.61	-10.39	+73.11	+53.11	Figure F-91

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Table F-30. Conducted Spurious Emissions – Channel 36

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.285	-45.83 -5.83	-27.83	+9.61	-10.39	+37.44	+17.44	Figure F-92
12.4 to 18.0 GHz	13.436	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+59.61	Figure F-93
18.0 to 26.5 GHz	18.737	-48.33 -28.33	-50.33	+9.61	-10.39	+59.94	+39.94	Figure F-94
26.5 to 40.0 GHz	36.72	-61.83 -41.83	-63.83	+9.61	-10.39	+73.44	+53.44	Figure F-95

Table F-31. Conducted Spurious Emissions – Channel 50

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.306*	-46.33 -6.33	-28.33	+9.61	-10.39	+37.94	+17.94	Figure F-96
12.4 to 18.0 GHz	12.503	-68.17 -48.17	-70.17	+9.61	-10.39	+79.78	+59.78	Figure F-97
18.0 to 26.5 GHz	18.779	-47.17 -27.17	-49.17	+9.61	-10.39	+58.78	+38.78	Figure F-98
26.5 to 40.0 GHz	28.14	-47.00 -27.00	-49.00	+9.61	-10.39	+58.61	+38.61	Figure F-99

* This spurious emission is within the authorized bandwidth.

Table F-32. Conducted Spurious Emissions – Channel 63

Emission Band	Spurious Frequency (GHz)	Emission Level (dBm)	Corrected Emission Level (-22dB)	40 dBc Limit (dBm)	60 dBc Limit (dBm)	Margin (dB) vs (40 dBc) Limit	Margin (dB) vs (60 dBc) Limit	Reference Figure
8.2 to 12.4 GHz	9.474*	-48.17 -8.17	-30.17	+9.61	-10.39	+39.78	+19.78	Figure F-100
12.4 to 18.0 GHz	12.475	-68.00 -48.00	-70.00	+9.61	-10.39	+79.61	+59.61	Figure F-101
18.0 to 26.5 GHz	18.808	-45.00 -25.00	-47.00	+9.61	-10.39	+56.61	+36.61	Figure F-102
26.5 to 40.0 GHz	28.19	-61.17 -41.17	-63.17	+9.61	-10.39	+72.78	+52.78	Figure F-103

* This spurious emission is within the authorized bandwidth.

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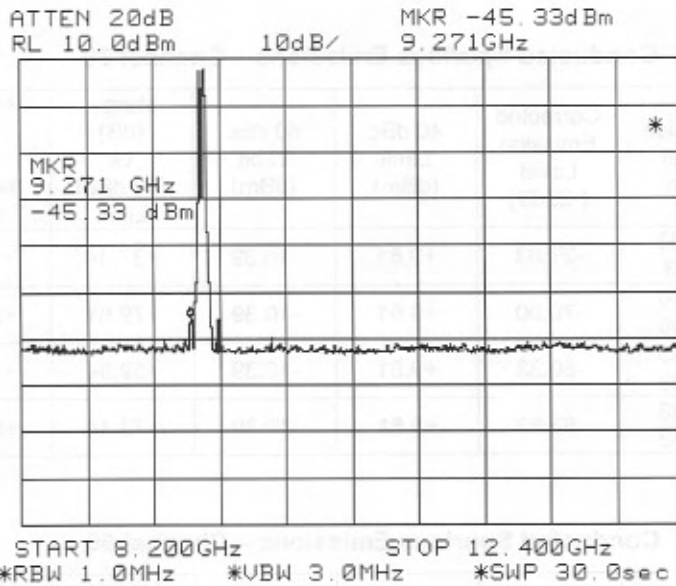


Figure F-44. Conducted Spurious Emissions, Normal, 8.2 – 12.4 GHz

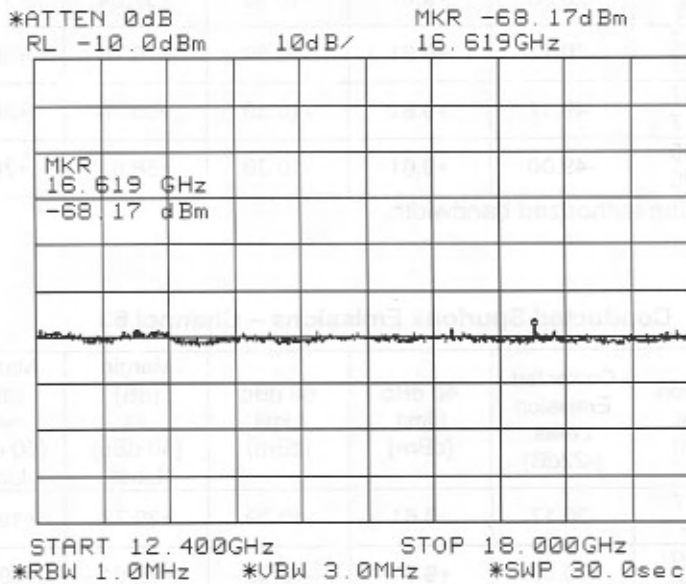


Figure F-45. Conducted Spurious Emissions, Normal, 12.4 – 18.0 GHz

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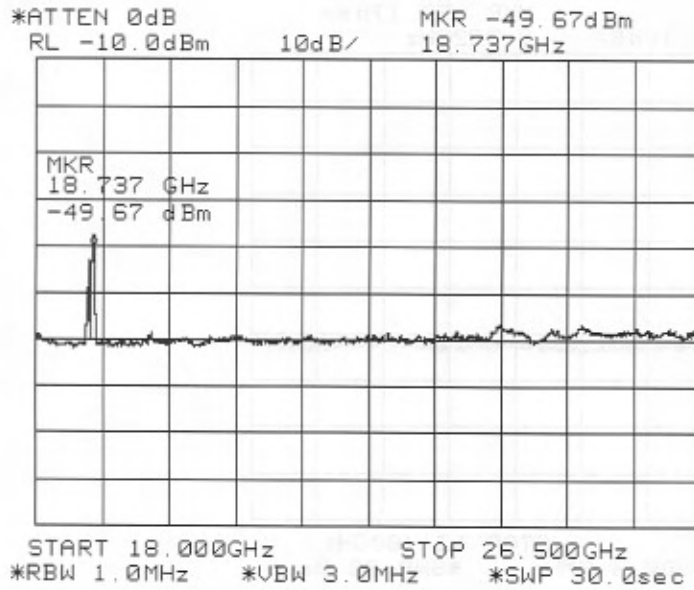


Figure F-46. Conducted Spurious Emissions, Normal, 18.0 – 26.5 GHz

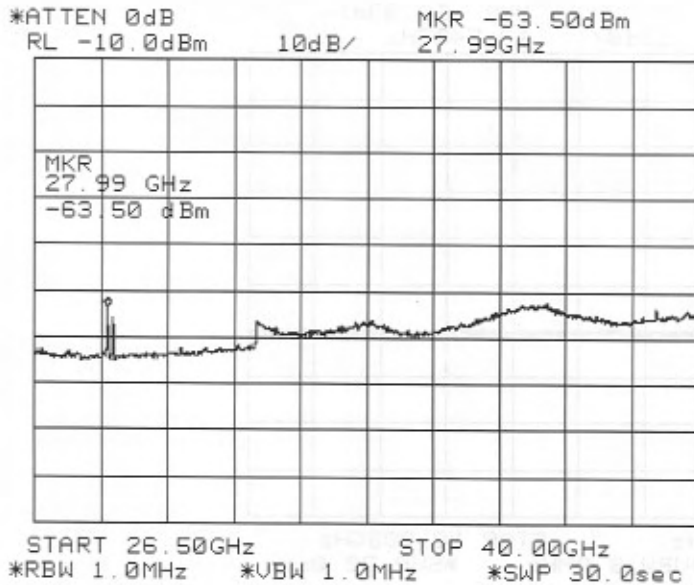


Figure F-47. Conducted Spurious Emissions, Normal, 26.5 – 40 GHz

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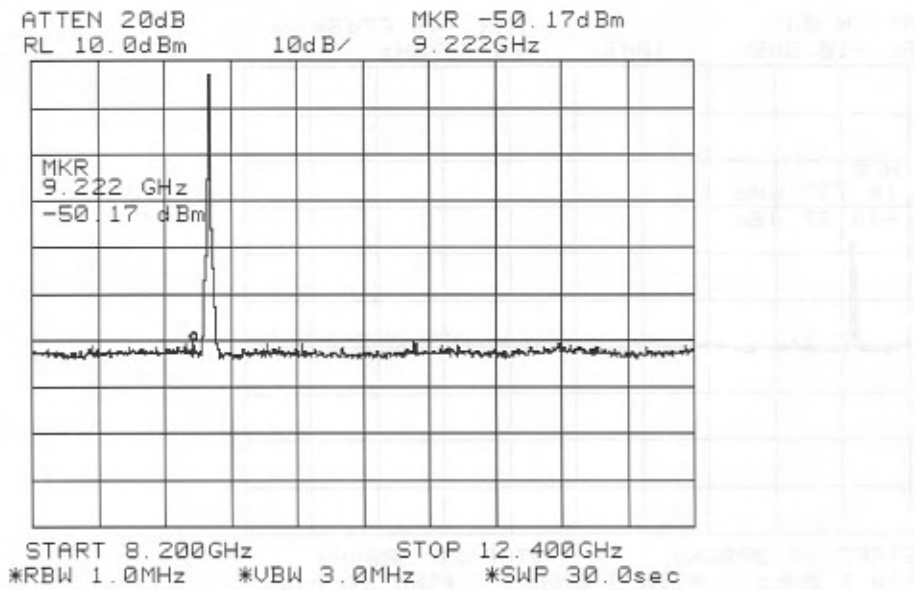


Figure F-48. Conducted Spurious Emissions, Channel 0, 8.2 – 12.4 GHz

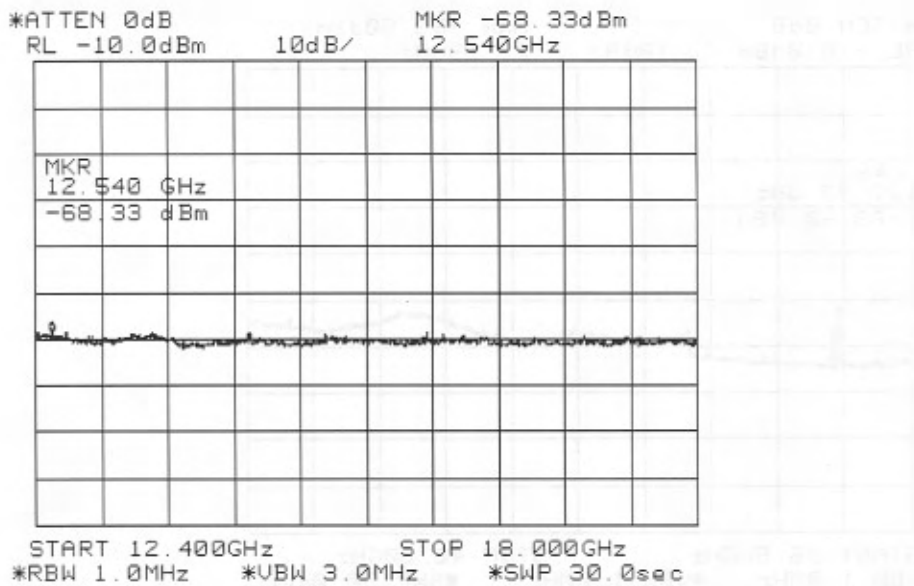


Figure F-49. Conducted Spurious Emissions, Channel 0, 12.4 – 18.0 GHz

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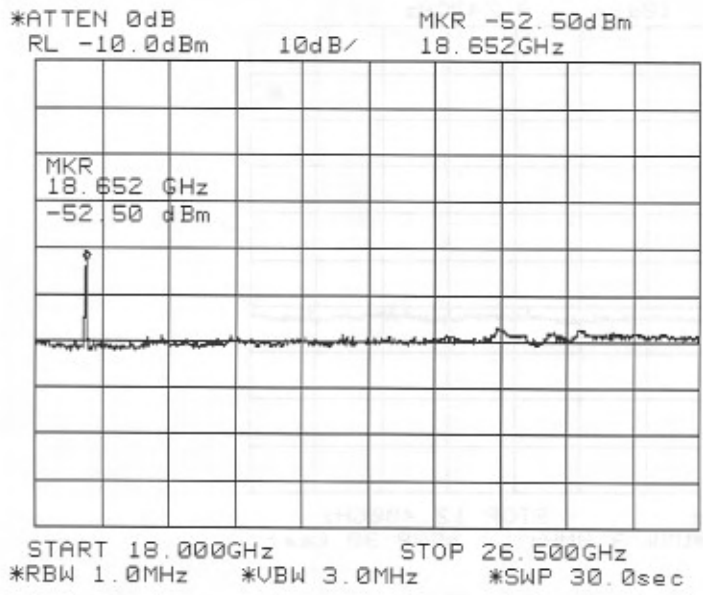


Figure F-50. Conducted Spurious Emissions, Channel 0, 18.0 – 26.5 GHz

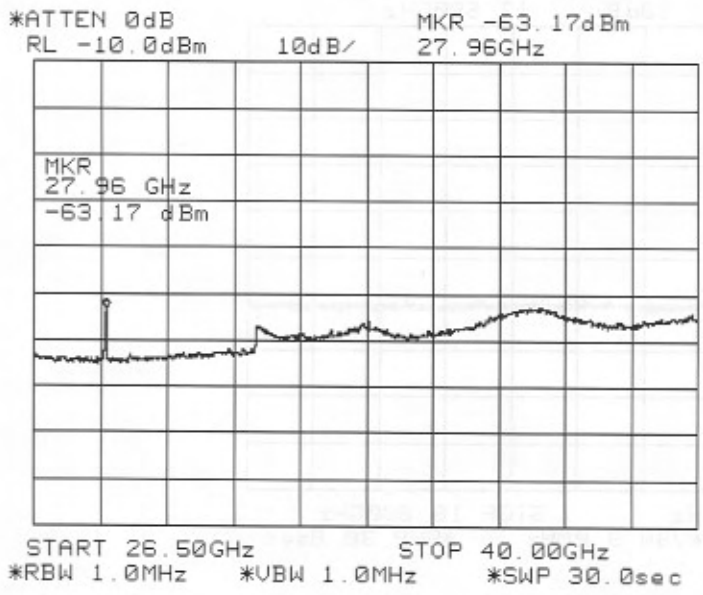


Figure F-51. Conducted Spurious Emissions, Channel 0, 26.5 – 40 GHz

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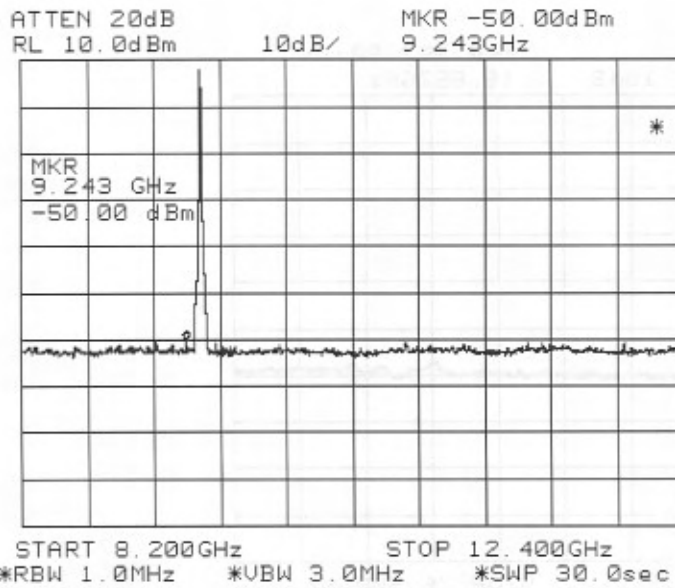


Figure F-52. Conducted Spurious Emissions, Channel 10, 8.2 – 12.4 GHz

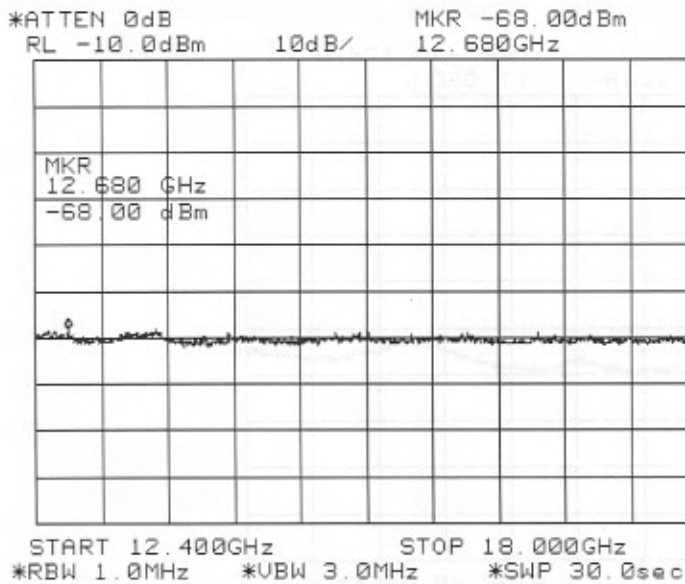


Figure F-53. Conducted Spurious Emissions, Channel 10, 12.4 – 18.0 GHz

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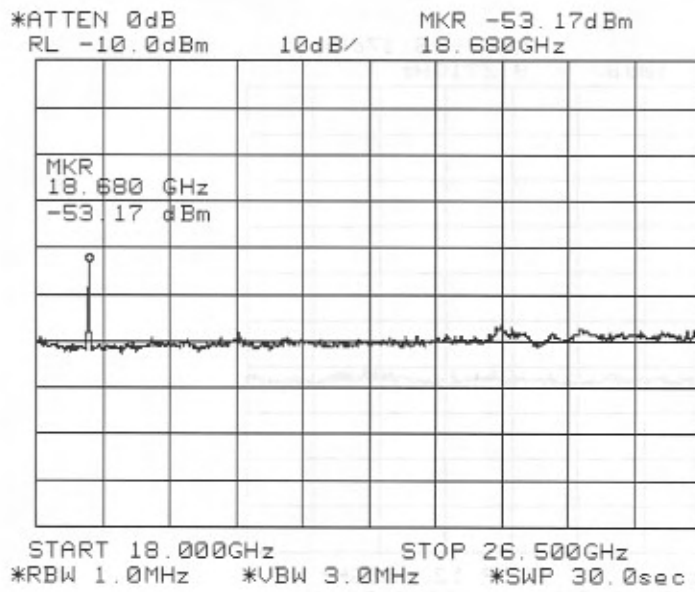


Figure F-54. Conducted Spurious Emissions, Channel 10, 18.0 – 26.5 GHz

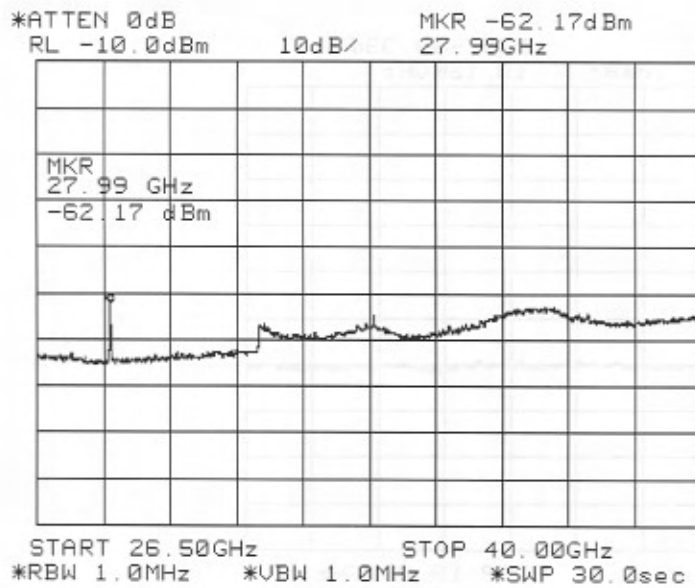


Figure F-55. Conducted Spurious Emissions, Channel 10, 26.5 – 40 GHz

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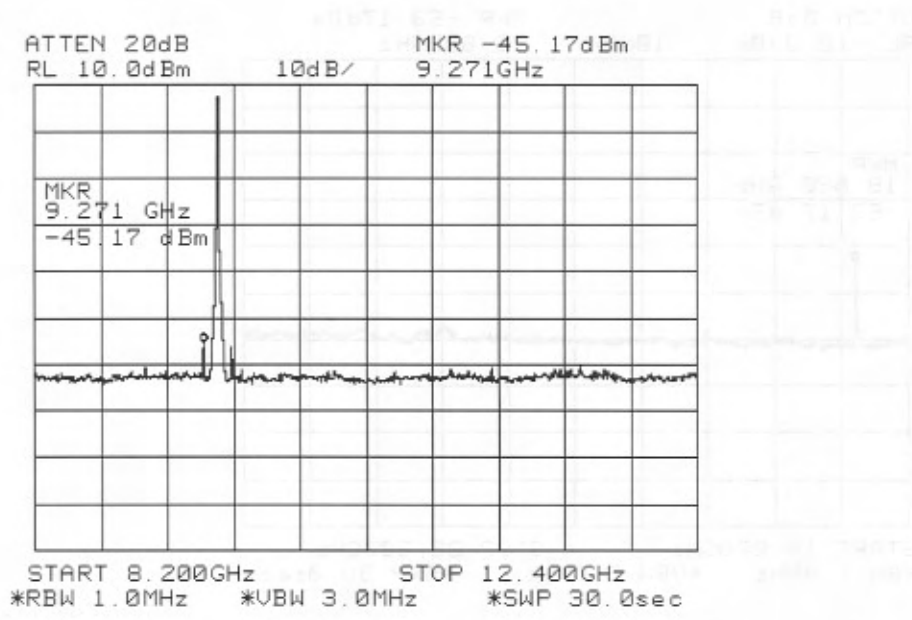


Figure F-56. Conducted Spurious Emissions, Channel 27, 8.2 – 12.4 GHz

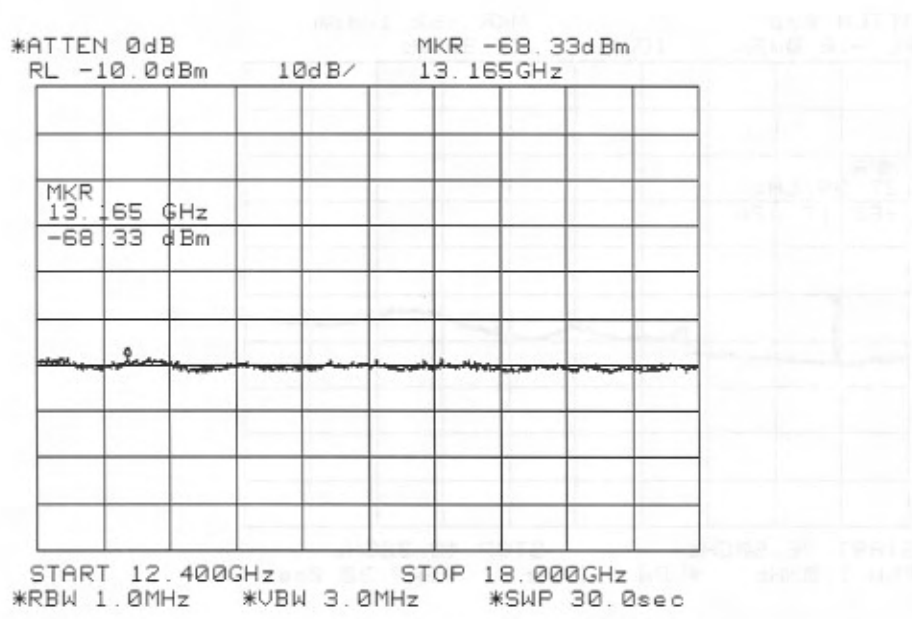


Figure F-57. Conducted Spurious Emissions, Channel 27, 12.4 – 18.0 GHz

WRAU-2120

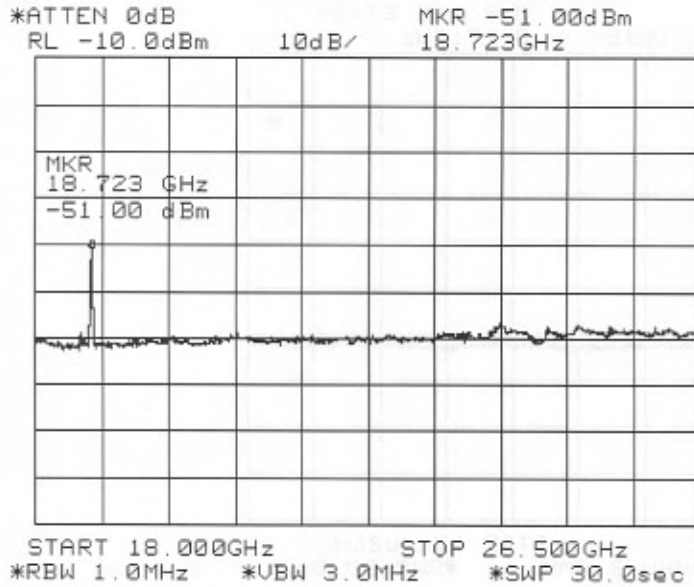


Figure F-58. Conducted Spurious Emissions, Channel 27, 18.0 – 26.5 GHz

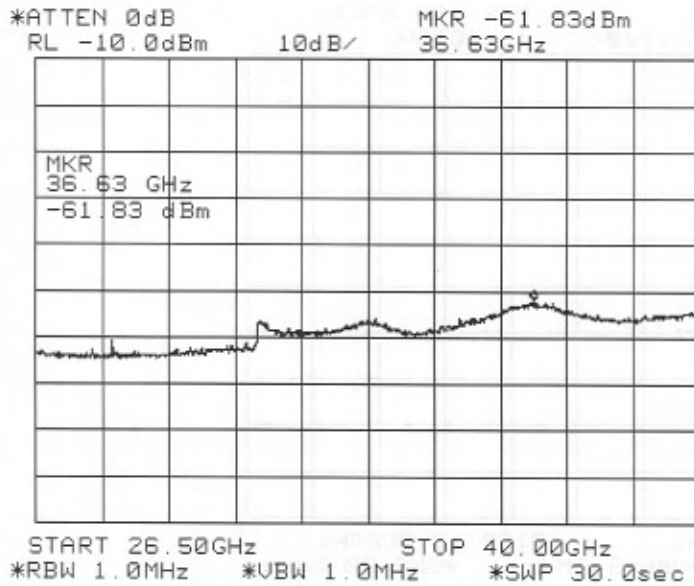


Figure F-59. Conducted Spurious Emissions, Channel 27, 26.5 – 40 GHz

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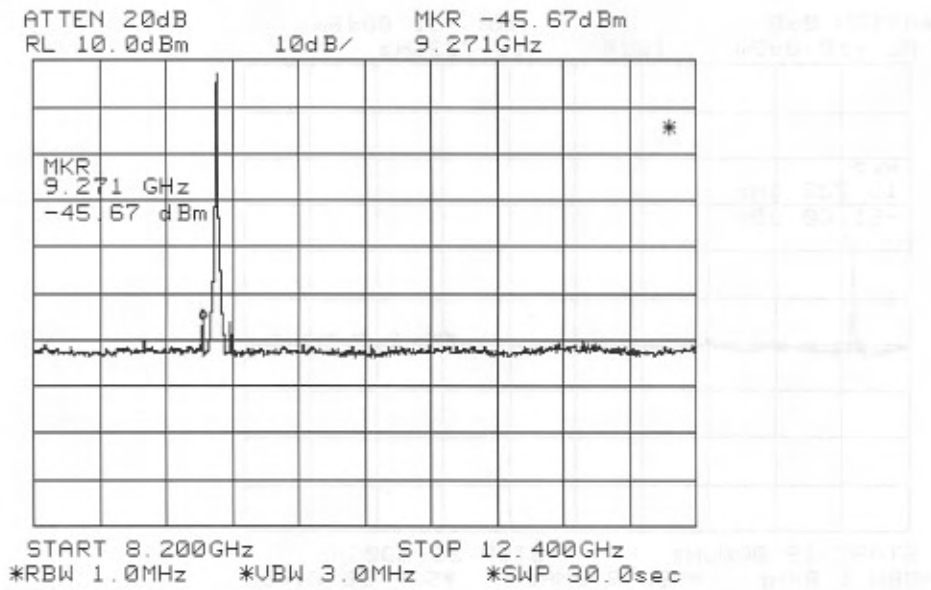


Figure F-60. Conducted Spurious Emissions, Channel 28, 8.2 – 12.4 GHz

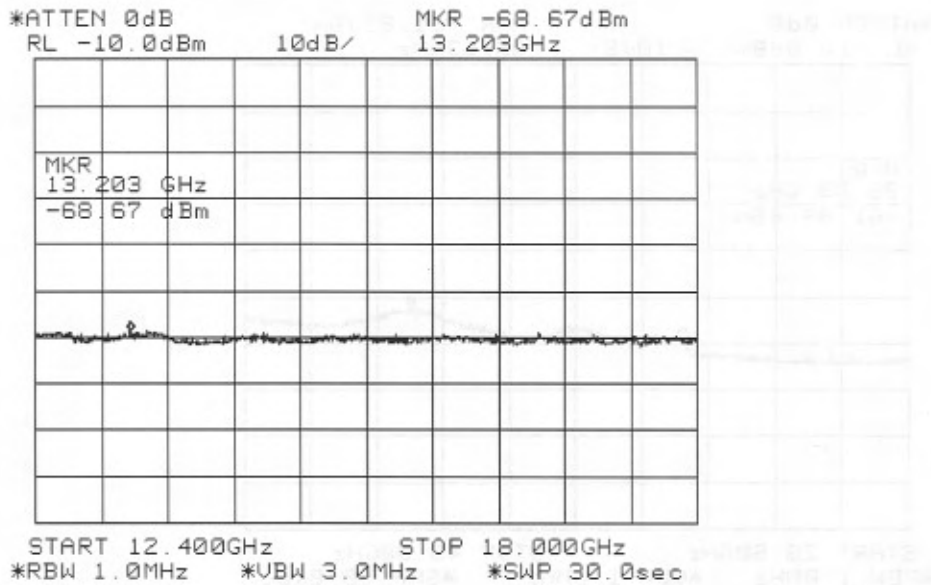


Figure F-61. Conducted Spurious Emissions, Channel 28, 12.4 – 18.0 GHz

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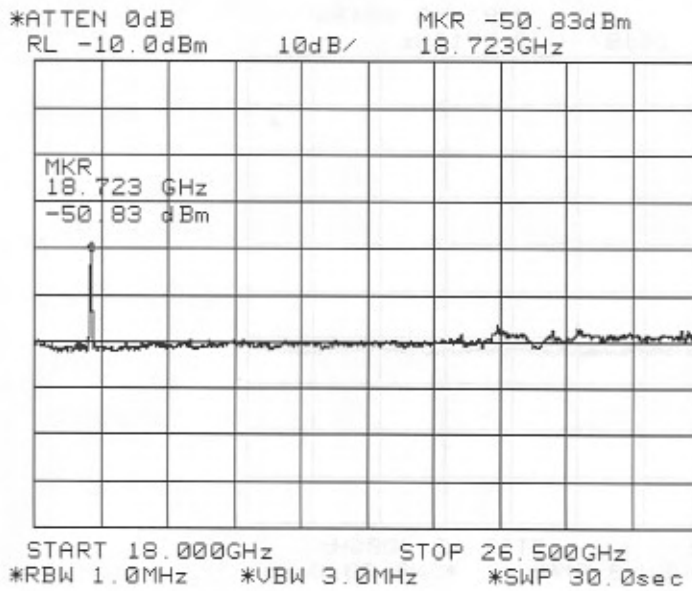


Figure F-62. Conducted Spurious Emissions, Channel 28, 18.0 – 26.5 GHz

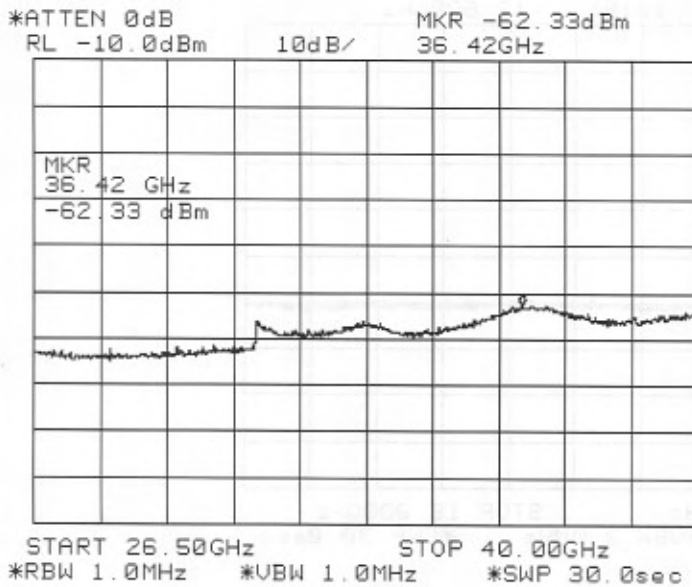


Figure F-63. Conducted Spurious Emissions, Channel 28, 26.5 – 40 GHz

WRAU-2120

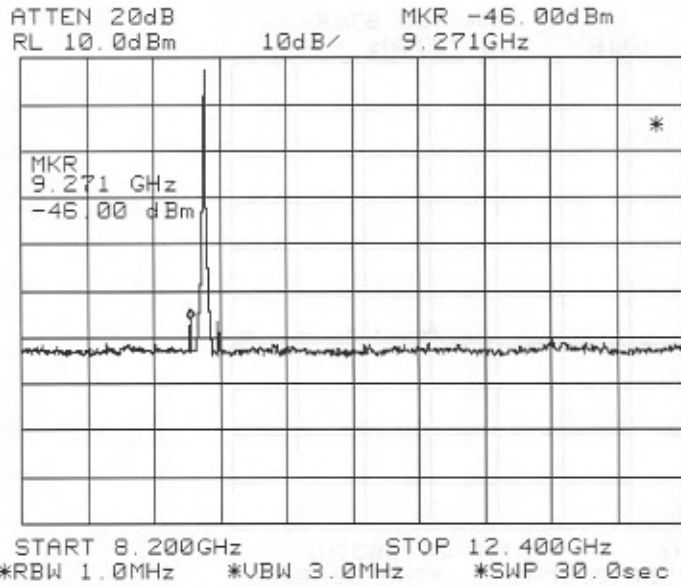


Figure F-64. Conducted Spurious Emissions, Channel 29, 8.2 – 12.4 GHz

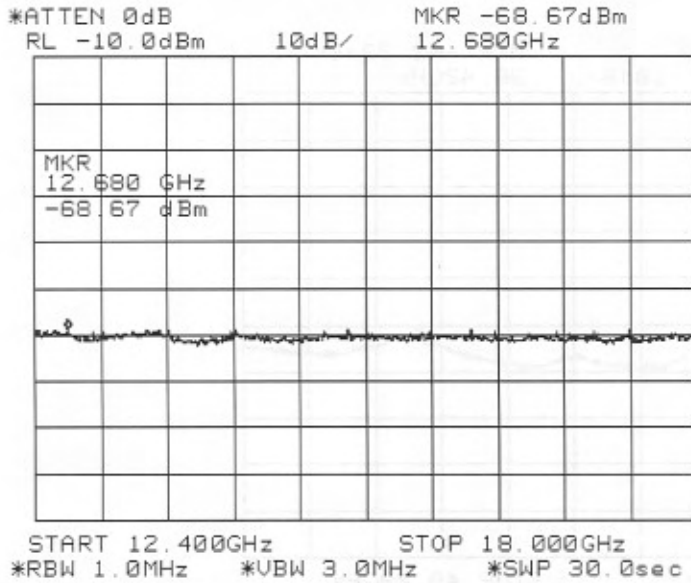


Figure F-65. Conducted Spurious Emissions, Channel 29, 12.4 – 18.0 GHz

WRAU-2120

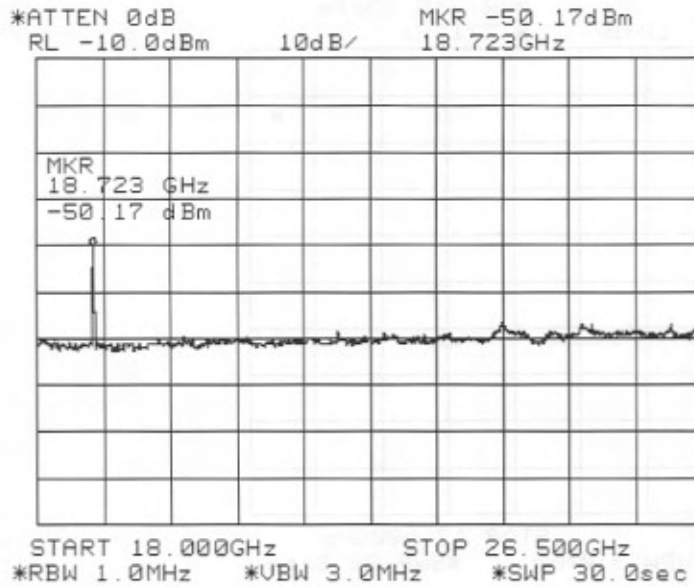


Figure F-66. Conducted Spurious Emissions, Channel 29, 18.0 – 26.5 GHz

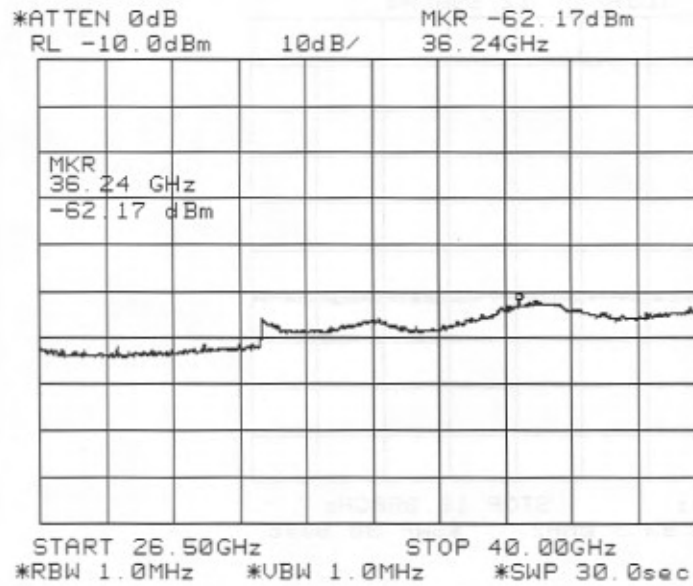


Figure F-67. Conducted Spurious Emissions, Channel 29, 26.5 – 40 GHz

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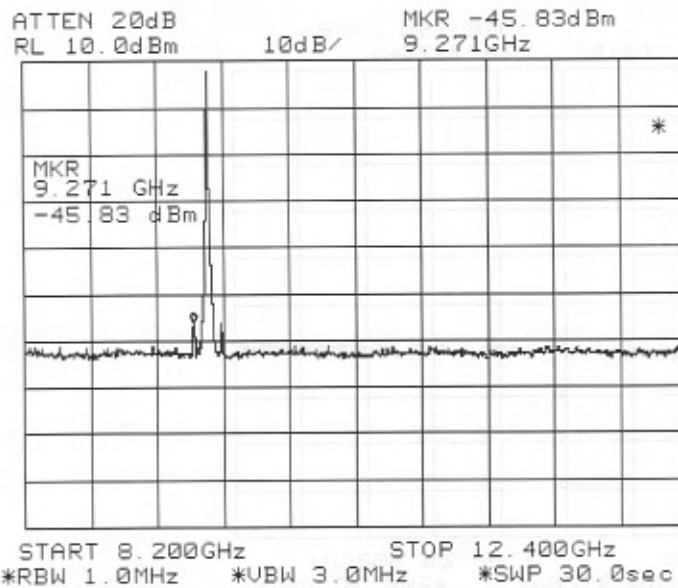


Figure F-68. Conducted Spurious Emissions, Channel 30, 8.2 – 12.4 GHz

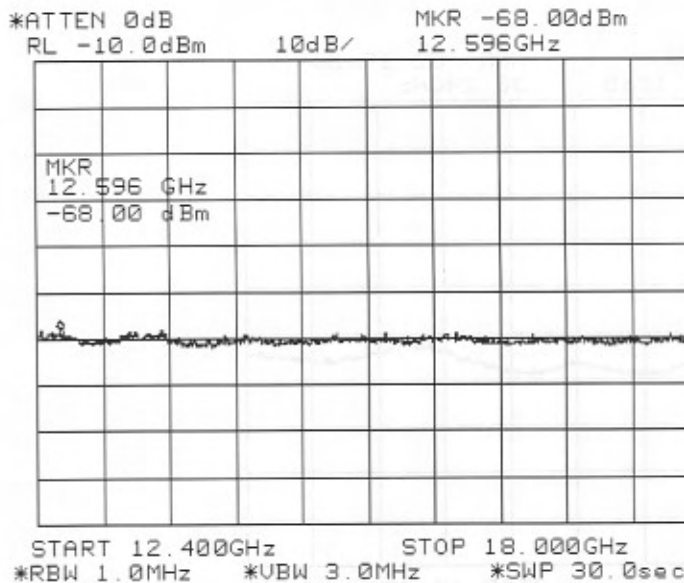


Figure F-69. Conducted Spurious Emissions, Channel 30, 12.4 – 18.0 GHz

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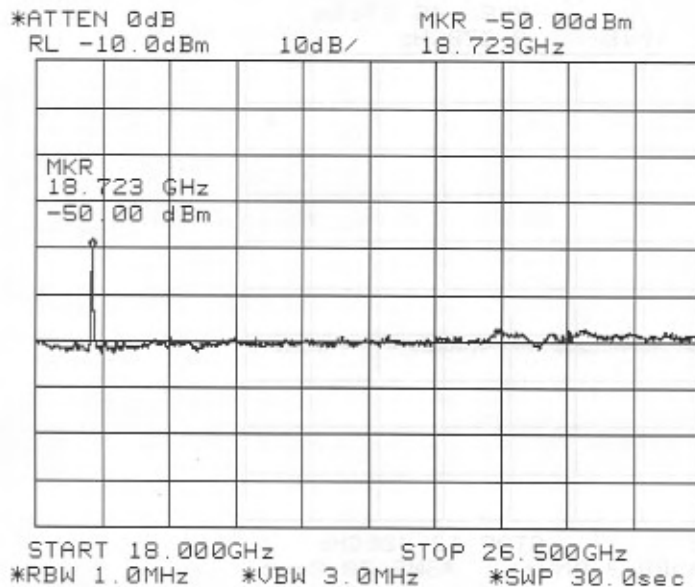


Figure F-70. Conducted Spurious Emissions, Channel 30, 18.0 – 26.5 GHz

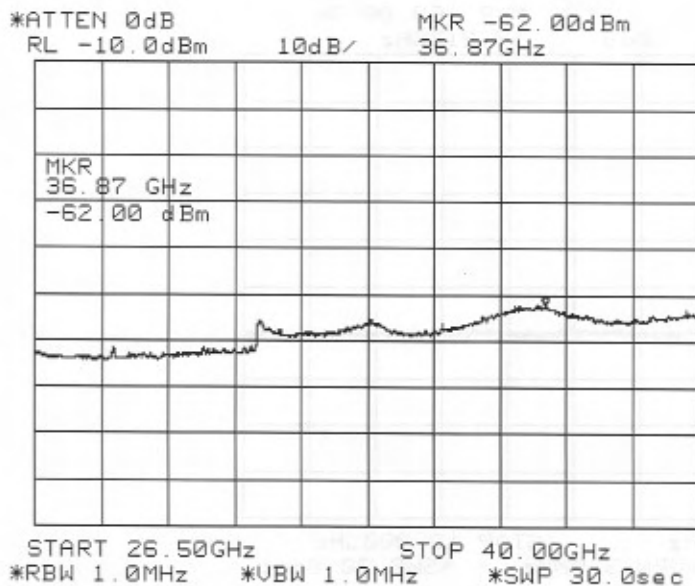


Figure F-71. Conducted Spurious Emissions, Channel 30, 26.5 – 40 GHz

WRAU-2120

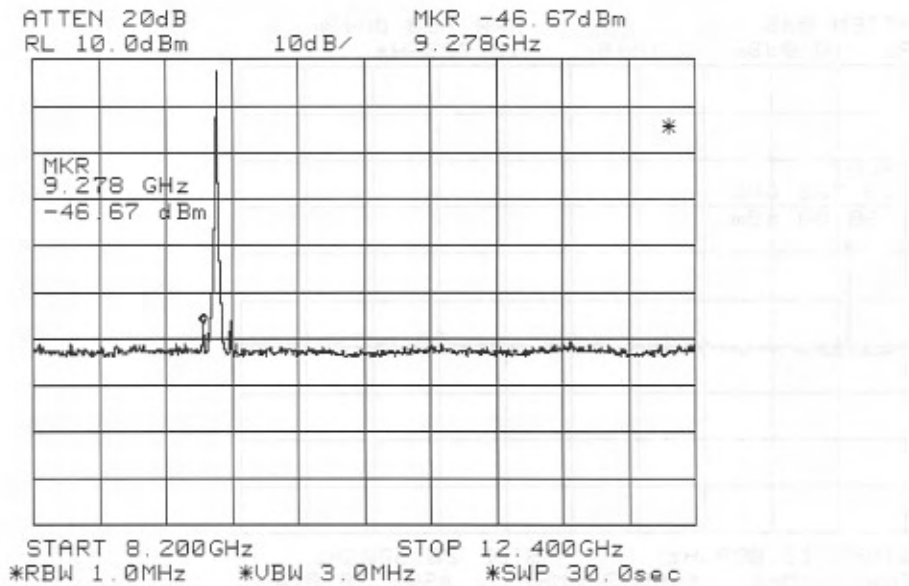


Figure F-72. Conducted Spurious Emissions, Channel 31, 8.2 – 12.4 GHz

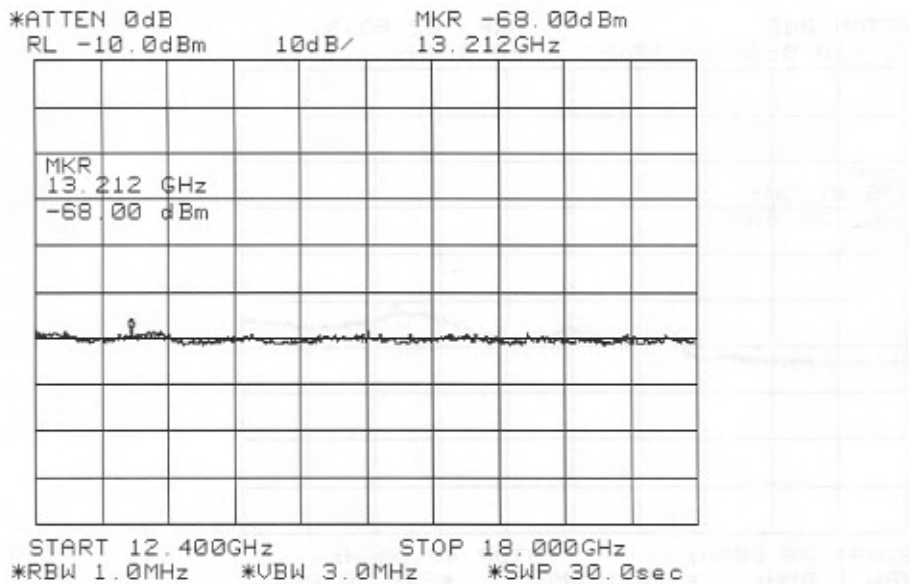


Figure F-73. Conducted Spurious Emissions, Channel 31, 12.4 – 18.0 GHz