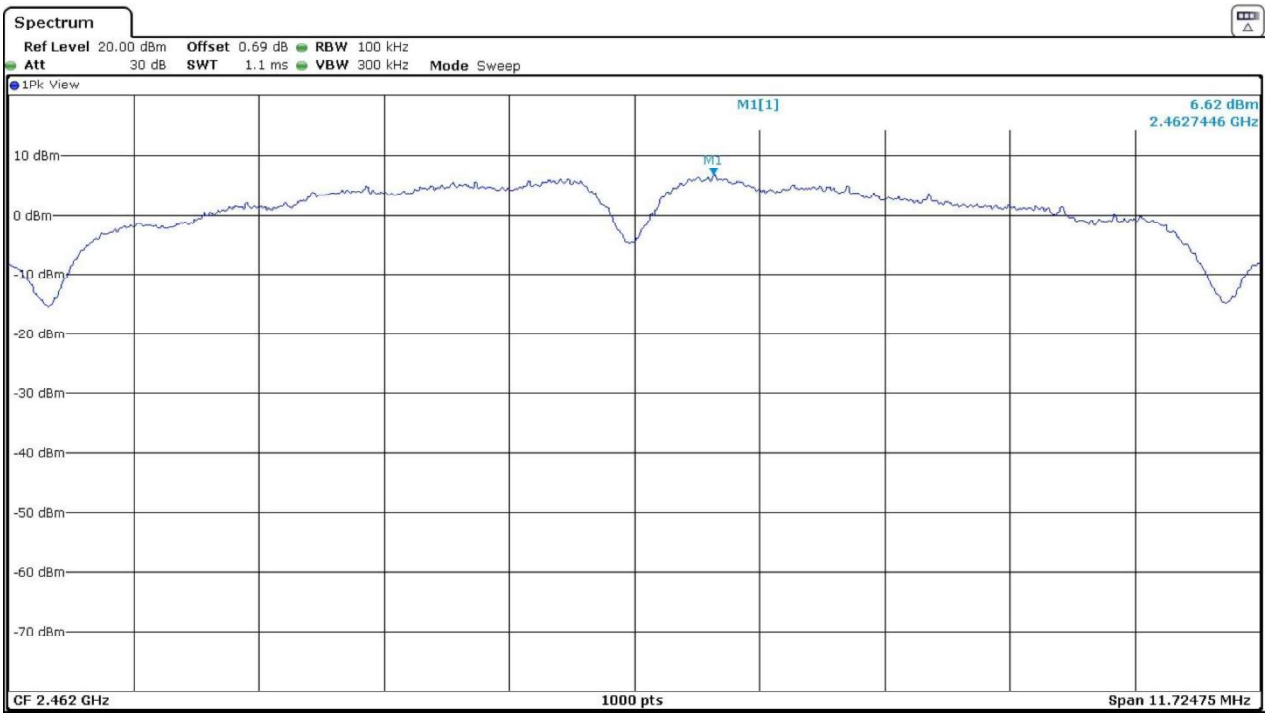
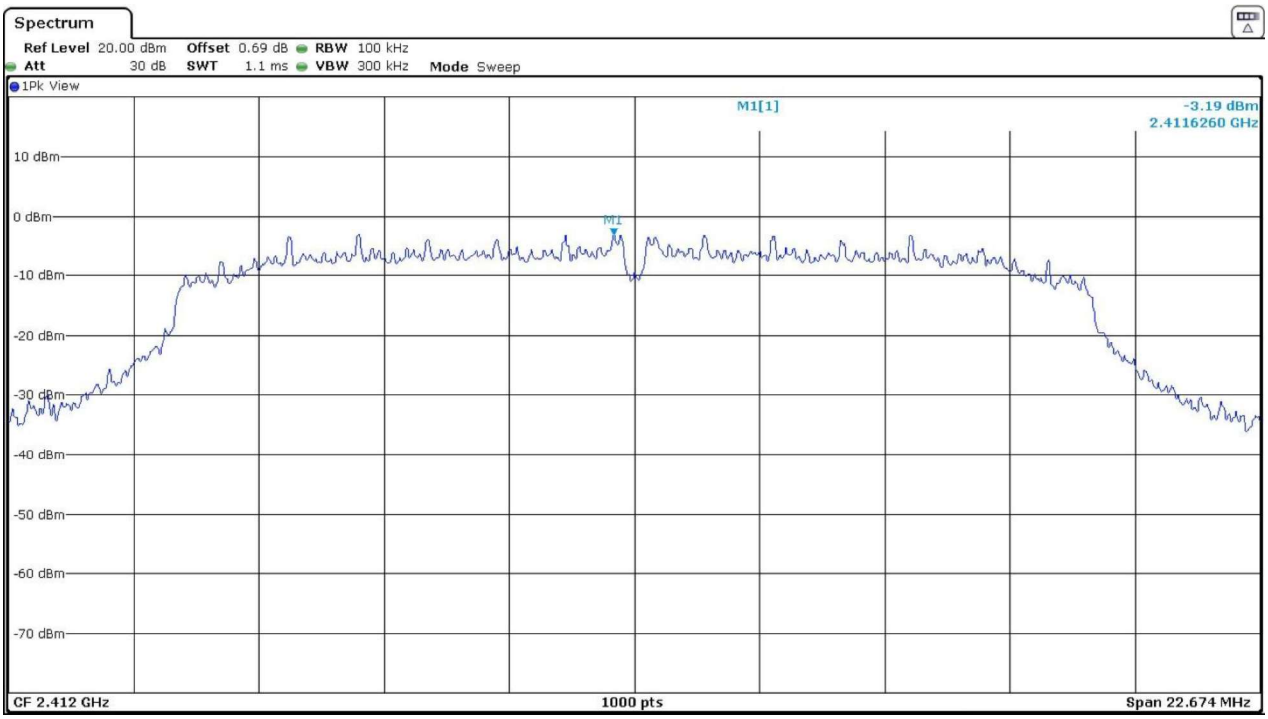
- High Channel:

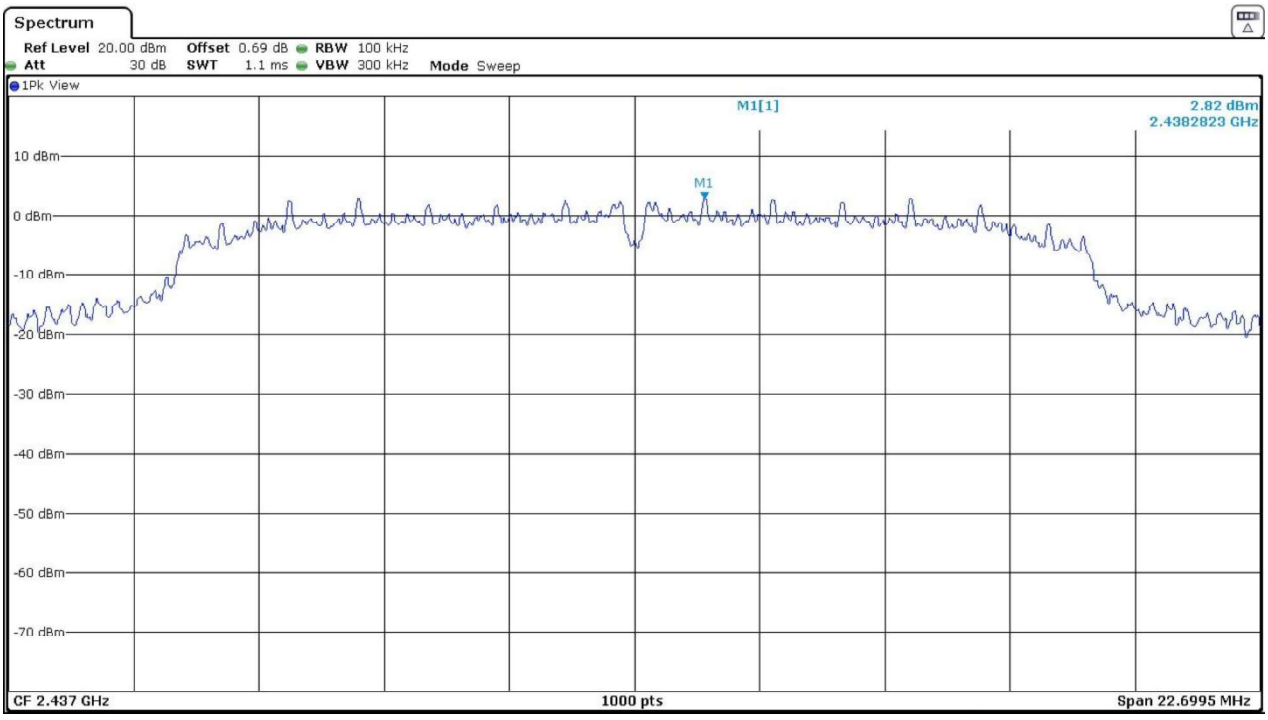


- **Mode 802.11 g – Power Spectral Density**

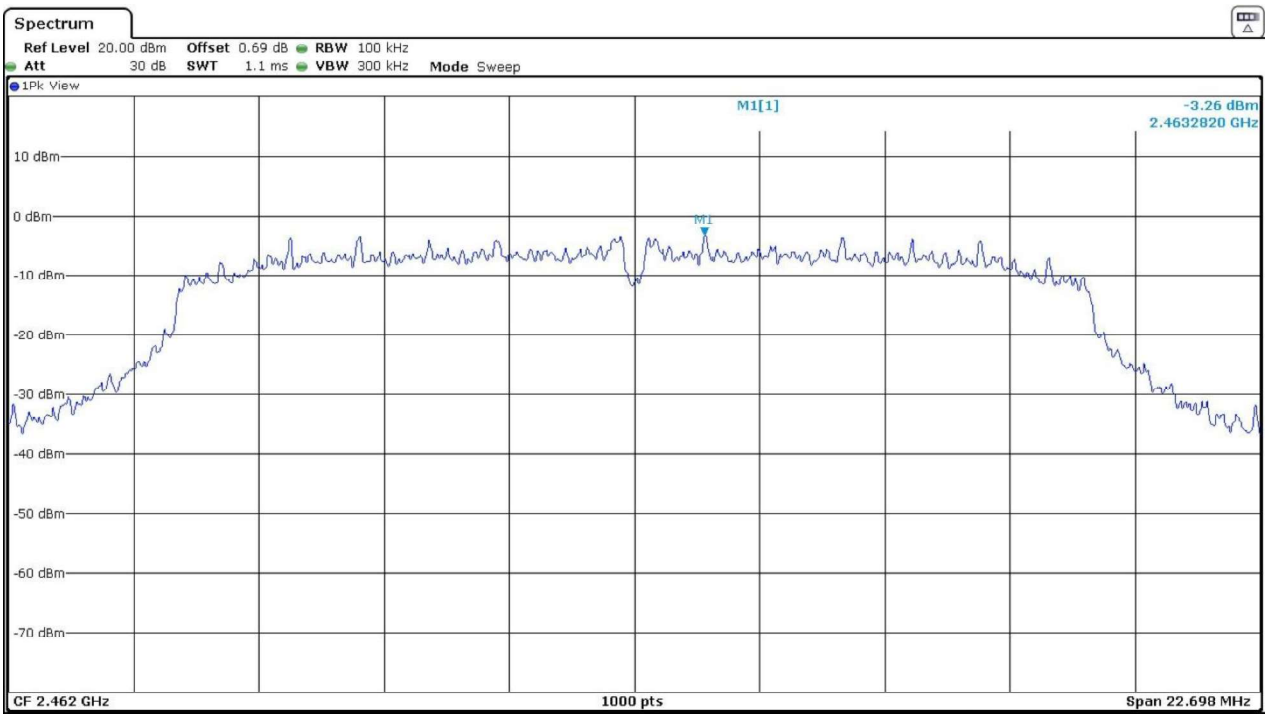
- Low Channel:



- Middle Channel:

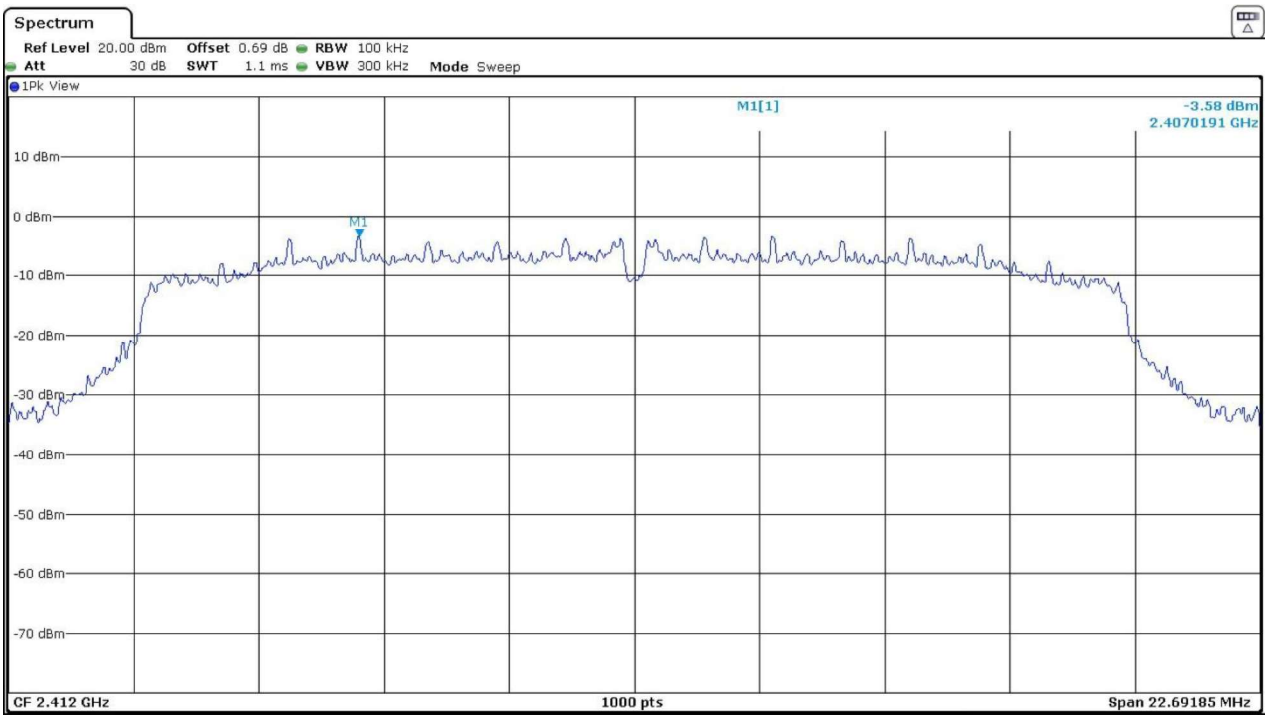


- High Channel:

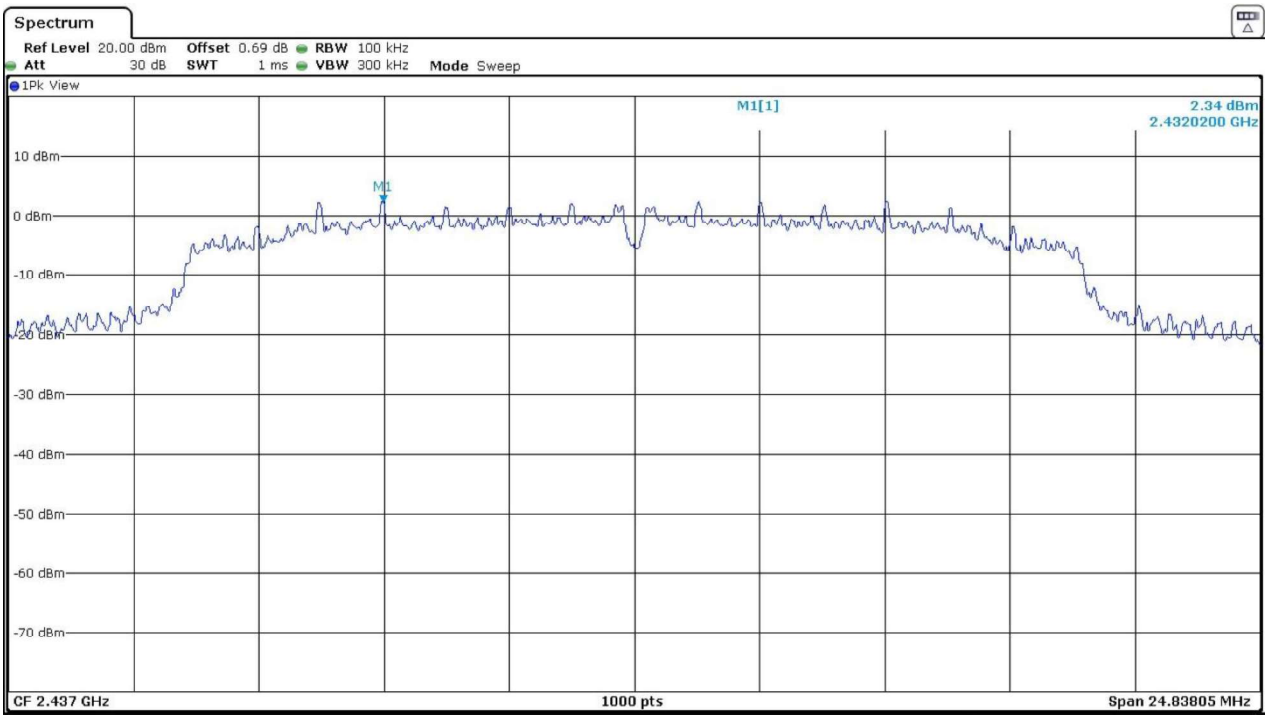


- **Mode 802.11 n20 – Power Spectral Density**

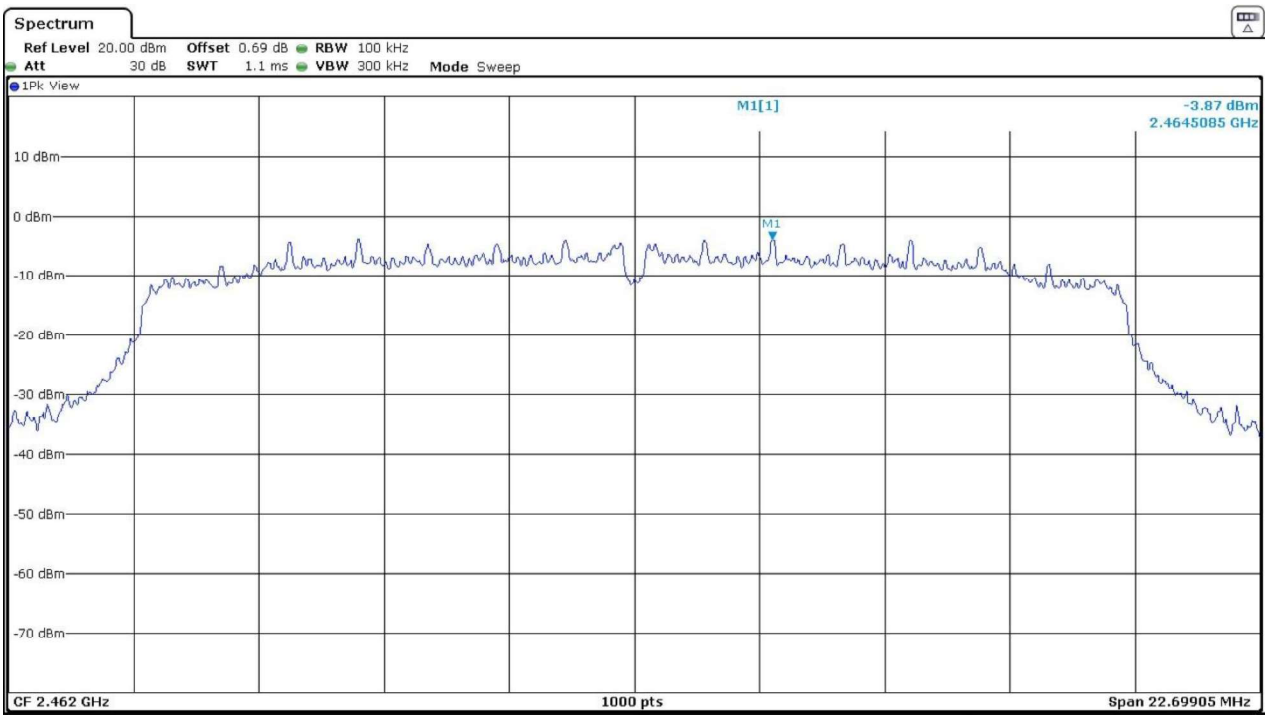
- Low Channel:



- Middle Channel:



- High Channel:



FCC Section 15.247 Subclause (d) / RSS-247 Clause 5.5. Emission limitations radiated (Transmitter)

SPECIFICATION:

Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)/RSS-Gen):

Frequency Range (MHz)	Field strength (µV/m)	Field strength (dBµV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 10000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function.

RSS-247: Attenuation below the general field strength limits specified in RSS-Gen is not required.

RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

All tests were performed in a semi-anechoic chamber at a distance of 3 m for the frequency range 30 MHz-1000 MHz and at distance of 1m for the frequency range 1 GHz-26 GHz.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

The field strength at the restricted bands and band edges was evaluated for each mode on the lowest and highest channels at the rated power for the channel under test. Where the power at the edge channels was lower than the power at the center channels additional measurements were made at the adjacent channels.

- **Mode 802.11 b**

  Frequency range 30 MHz - 1 GHz:

  The spurious frequencies do not depend on the operating channel.

  No spurious frequencies were found at less than 20 dB below the limit.

Frequency range 1 - 26 GHz:

The results in the next tables show the maximum measured levels in the 1-25 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Spurious signals with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for checking compliance with the average limit.

- LOW CHANNEL. Spurious frequencies closest to the limit:

Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
7.23640	Peak	43.96	H	<± 3.70
9.64786	Peak	46.42	H	<± 3.70

- MIDDLE CHANNEL. Spurious frequencies closest to the limit:

Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
4.87388	Peak	37.61	H	<± 3.70

- HIGH CHANNEL. Spurious frequencies closest to the limit:

Spurious frequency (MHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
7.38706	Peak	43.2	H	<± 3.70

- RESTRICTED BAND 1 (2.31 - 2.39 GHz). Spurious frequencies closest to the limit:

Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 1	2.3899133	Peak	56.34	H	<±3.70
		Average	47.99		<±3.70
CH 2	2.38983	Peak	53.74	H	<±3.70
CH 3	2.32911	Peak	52.45	H	<±3.70
CH 4	2.3786	Peak	52.43	H	<±3.70

- RESTRICTED BAND 2 (2.4835 - 2.5 GHz). Spurious frequencies closest to the limit:

Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 8	2.49900	Peak	53.60	H	<±3.70
CH 9	2.49480	Peak	53.69	H	<±3.70
CH 10	2.48576	Peak	54.24	H	<±3.70
		Average	44.70		<±3.70
CH 11	2.48406	Peak	56.52	H	<±3.70
		Average	48.89		<±3.70

Verdict: PASS

OFDM modes:

For spurious emissions in the range 30 MHz - 25 GHz (except field strength at the band edges that was performed for all modes) a preliminary scan was performed to determine the worst case mode. Herein the results for the worst case mode: 802.11g.

Spurious emissions in the Restricted Band 1 and Restricted Band 2 are measured for all modes.

- **Mode 802.11 g (OFDM worst case for spurious emissions)**

Frequency range 30 MHz - 1 GHz:

The spurious frequencies do not depend on the operating channel.

No spurious frequencies were found at less than 20 dB below the limit.

Frequency range 1 - 26 GHz:

The results in the next tables show the maximum measured levels in the 1-25 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Spurious signals with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for checking compliance with the average limit.

- LOW CHANNEL.

No spurious frequencies were found at less than 20 dB below the limit.

- MIDDLE CHANNEL.

No spurious frequencies were found at less than 20 dB below the limit.

- HIGH CHANNEL.

No spurious frequencies were found at less than 20 dB below the limit.

- RESTRICTED BAND 1 (2.31 - 2.39 GHz). Spurious frequencies closest to the limit:

Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 1	2.38998	Peak	65.87	H	<±3.70
		Average	47.72		<±3.70
CH 2	2.38968	Peak	68.65	H	<±3.70
		Average	47.76		<±3.70
CH 3	2.38894	Peak	68.99	H	<±3.70
		Average	47.41		<±3.70
CH 4	2.38909	Peak	66.83	H	<±3.70
		Average	46.23		<±3.70

- RESTRICTED BAND 2 (2.4835 - 2.5 GHz). Spurious frequencies closest to the limit:

Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 8	2.48743	Peak	67.40	H	<±3.70
		Average	46.39		<±3.70
CH 9	2.48388	Peak	70.72	H	<±3.70
		Average	48.92		<±3.70
CH 10	2.48424	Peak	71.56	H	<±3.70
		Average	49.19		<±3.70
CH 11	2.48381	Peak	65.93	H	<±3.70
		Average	48.33		<±3.70

Verdict: PASS

- **Mode 802.11 n20**

Frequency range 1 - 26 GHz:

The results in the next tables show the maximum measured levels in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

Spurious signals with peak levels above the average limit (54 dBµV/m at 3 m) are measured with average detector for checking compliance with the average limit.

- RESTRICTED BAND 1 (2.31 - 2.39 GHz). Spurious frequencies closest to the limit:

Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 1	2.38972	Peak	64.79	H	<±3.70
		Average	47.64		<±3.70
CH 2	2.38904	Peak	69.29	H	<±3.70
		Average	49.01		<±3.70
CH 3	2.38886	Peak	70.56	H	<±3.70
		Average	49.18		<±3.70
CH 4	2.38990	Peak	65.97	H	<±3.70
		Average	45.91		<±3.70

- RESTRICTED BAND 2 (2.4835 - 2.5 GHz). Spurious frequencies closest to the limit:

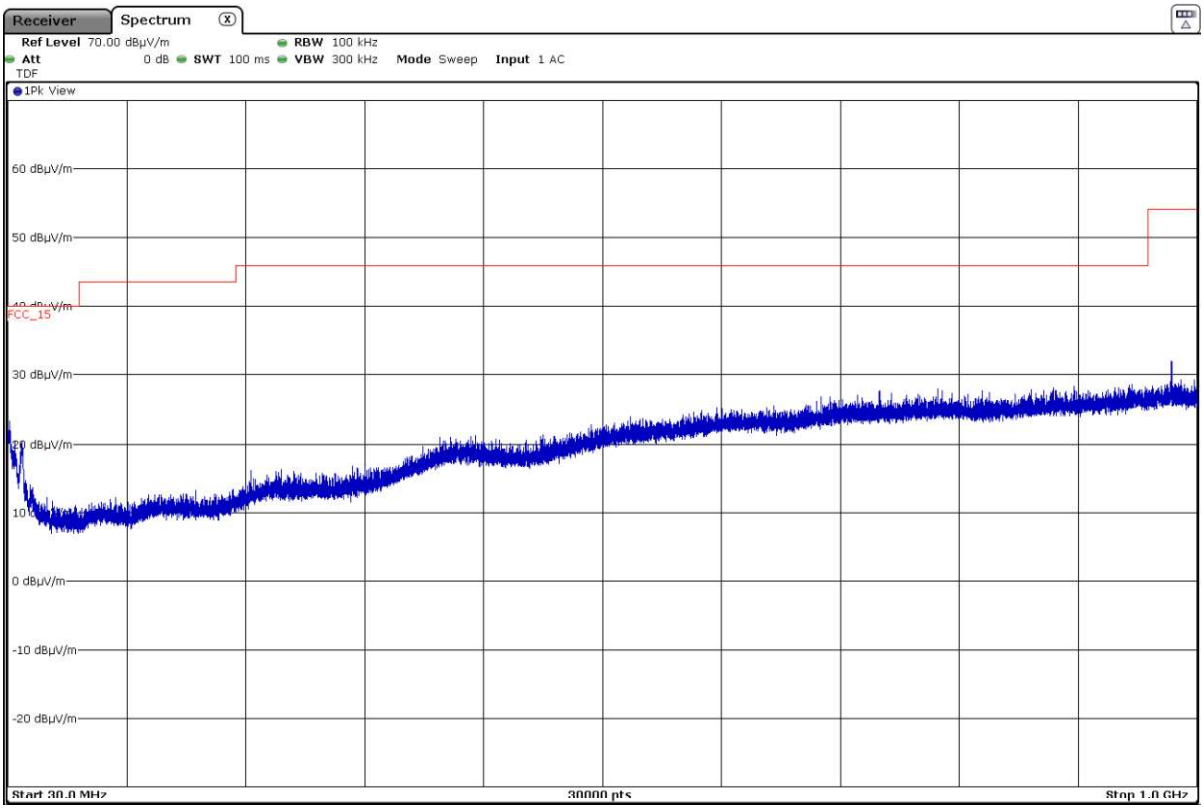
Channel	Spurious frequency (GHz)	Detector	Emission Level (dBµV/m)	Polarization	Measurement Uncertainty (dB)
CH 8	2.48405	Peak	66.13	H	<±3.70
		Average	46.34		<±3.70
CH 9	2.48396	Peak	71.11	H	<±3.70
		Average	49.84		<±3.70
CH 10	2.48452	Peak	72.37	H	<±3.70
		Average	49.25		<±3.70
CH 11	2.48356	Peak	67.89	H	<±3.70
		Average	48.26		<±3.70

Verdict: PASS

- **Mode 802.11 b**

FREQUENCY RANGE 30 MHz - 1 GHz:

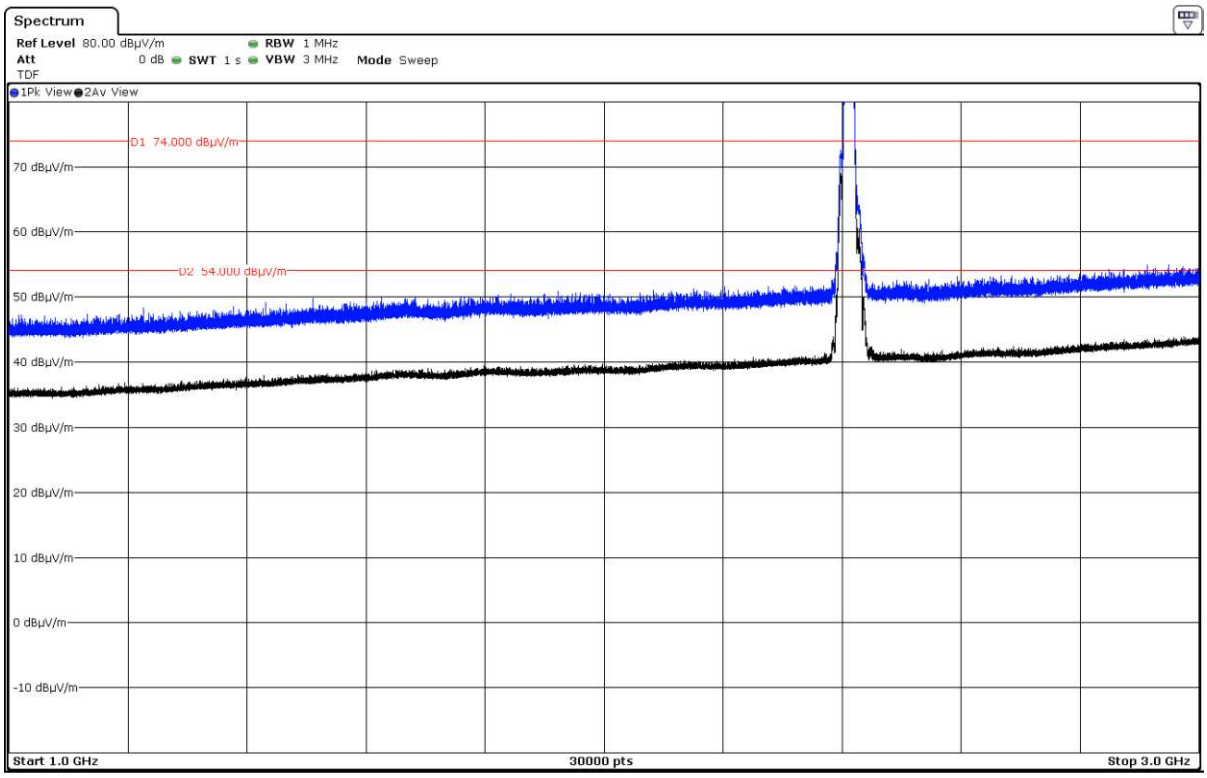
The spurious signals detected do not depend on the operating channel.



Note: This plot is valid for all three channels.

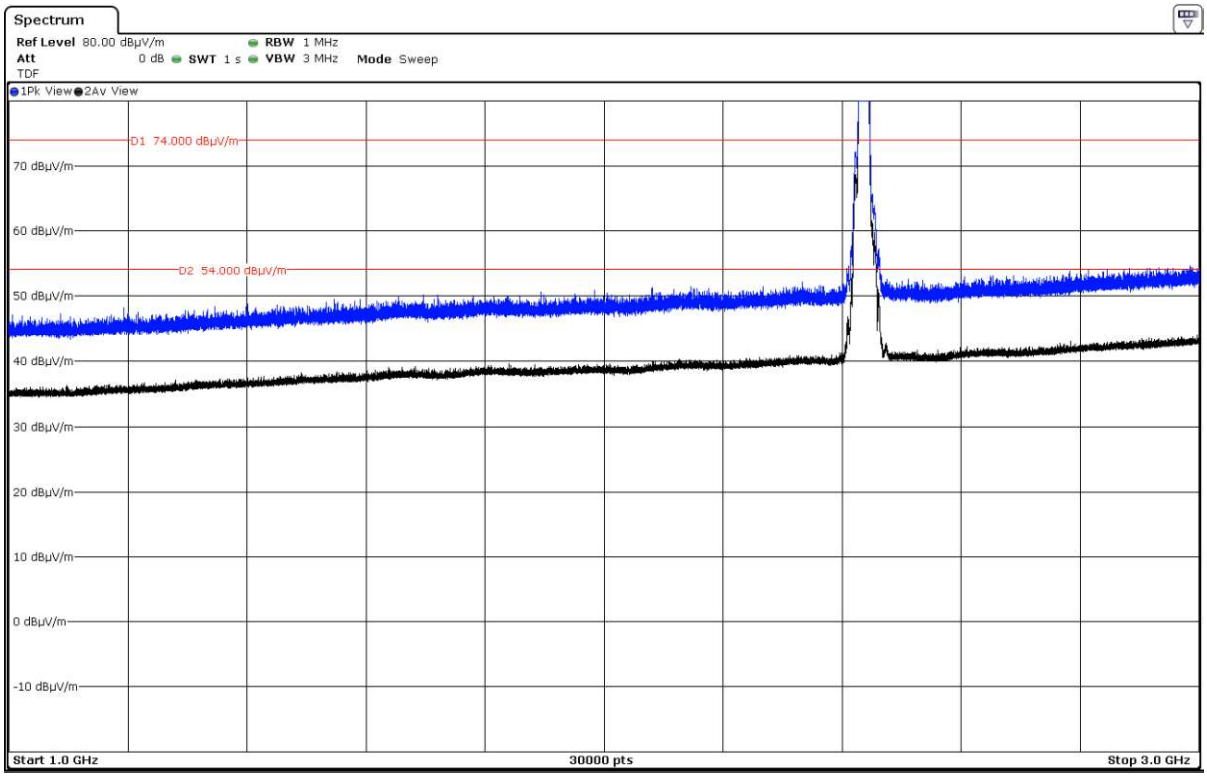
FREQUENCY RANGE 1 - 3 GHz:

- Low Channel:



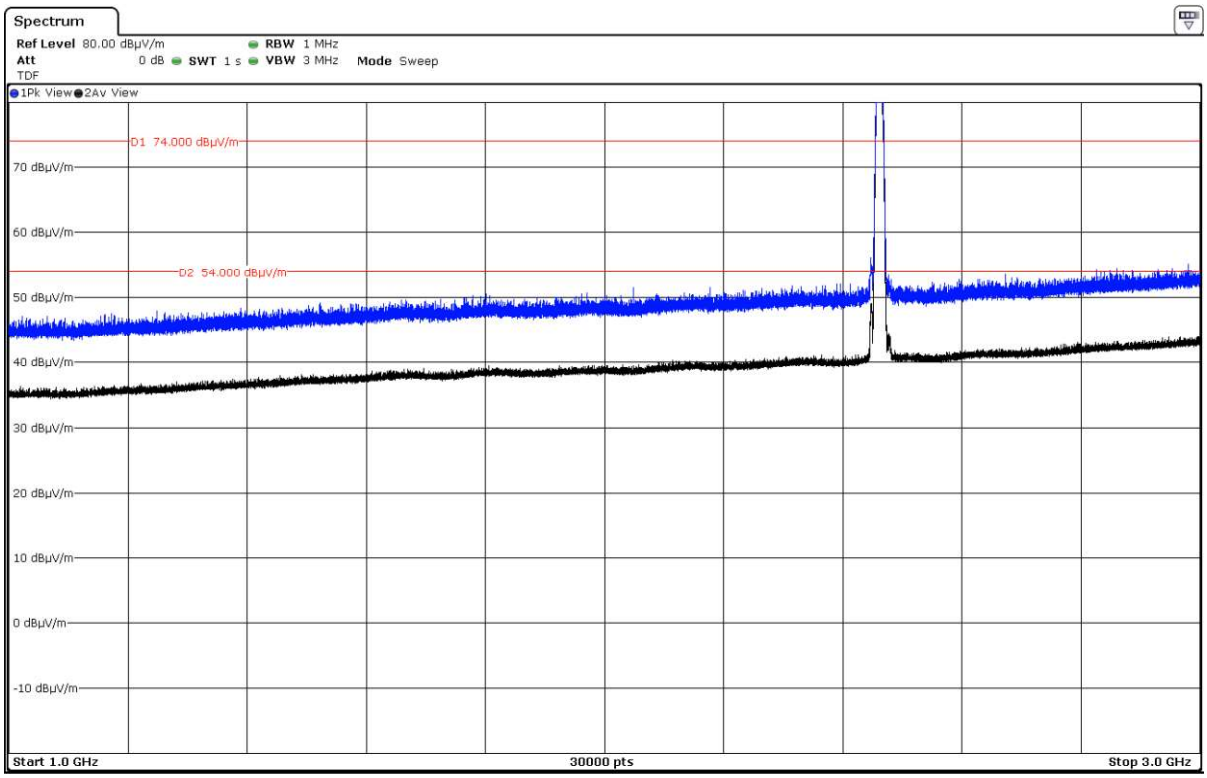
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

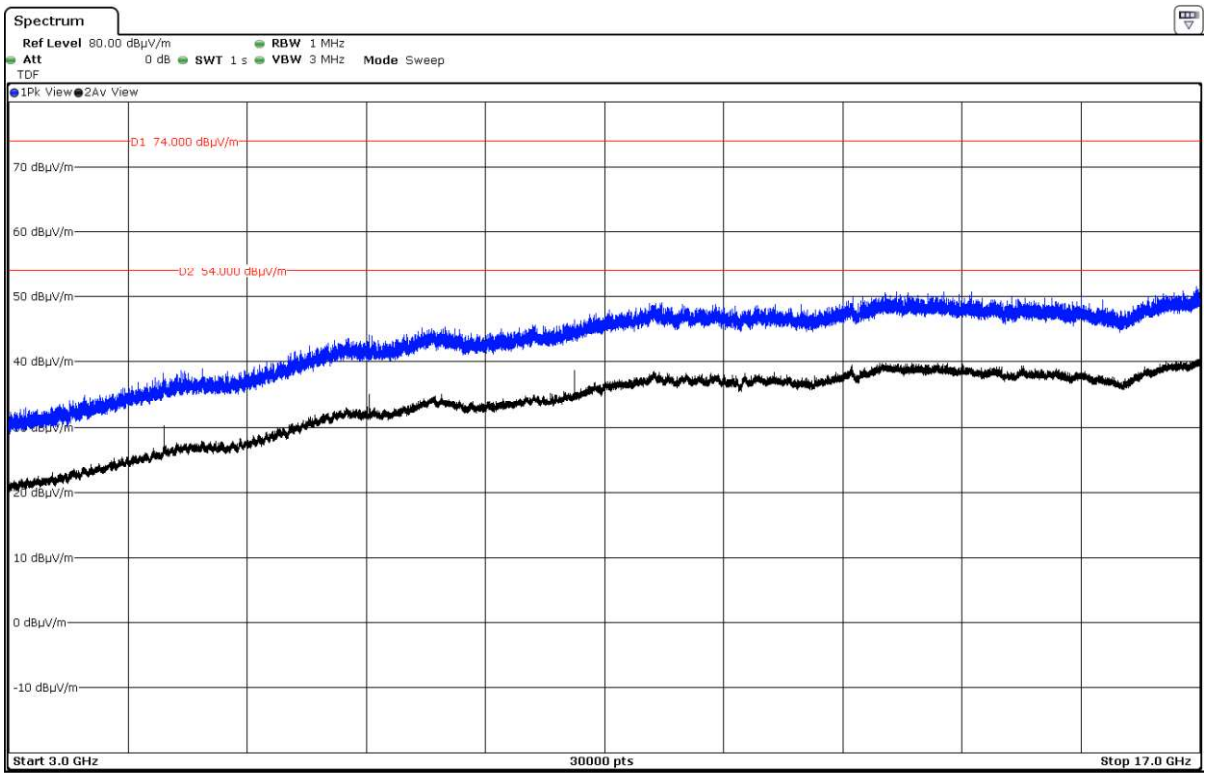
- High Channel:



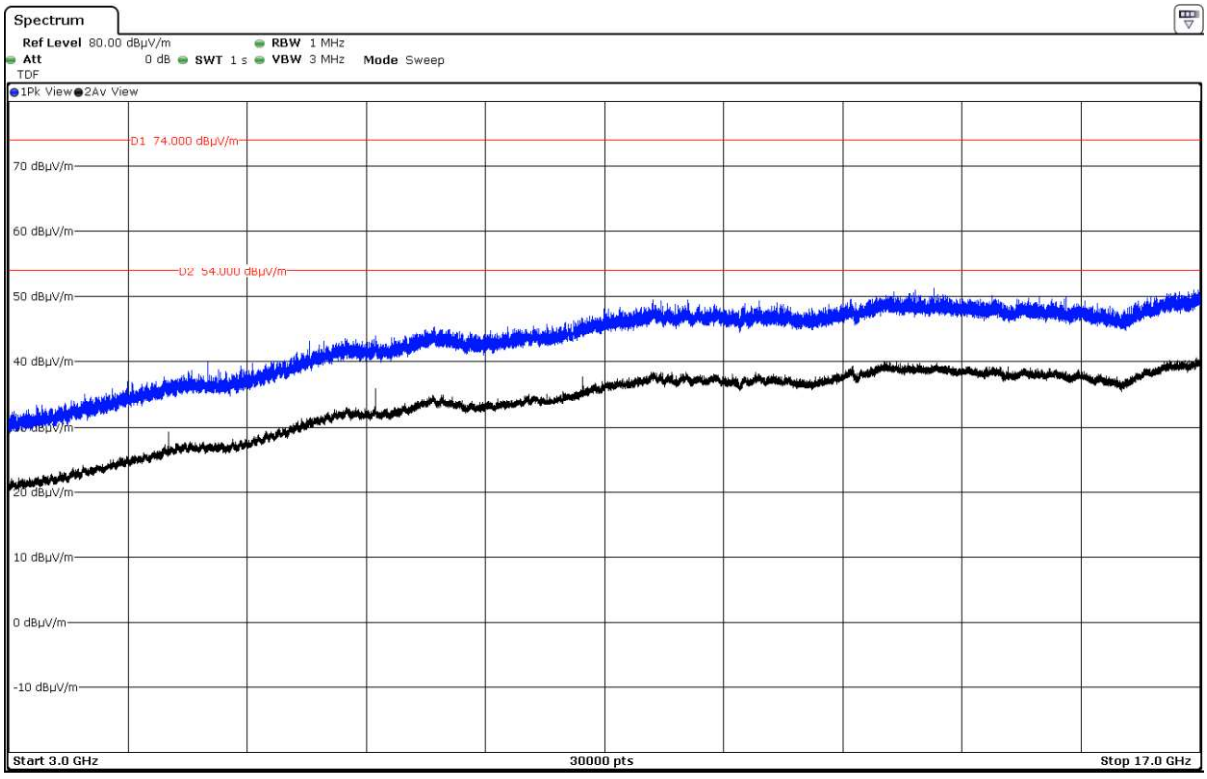
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 - 17 GHz:

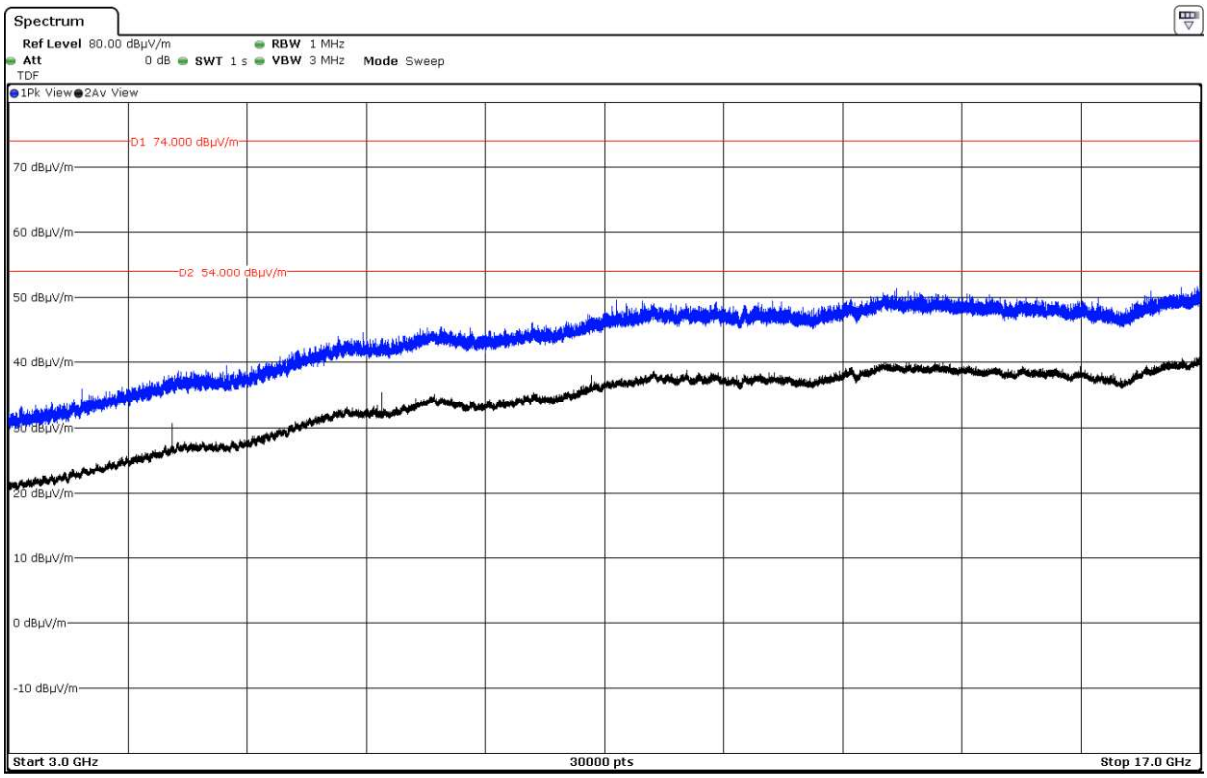
- Low Channel:



- Middle Channel:

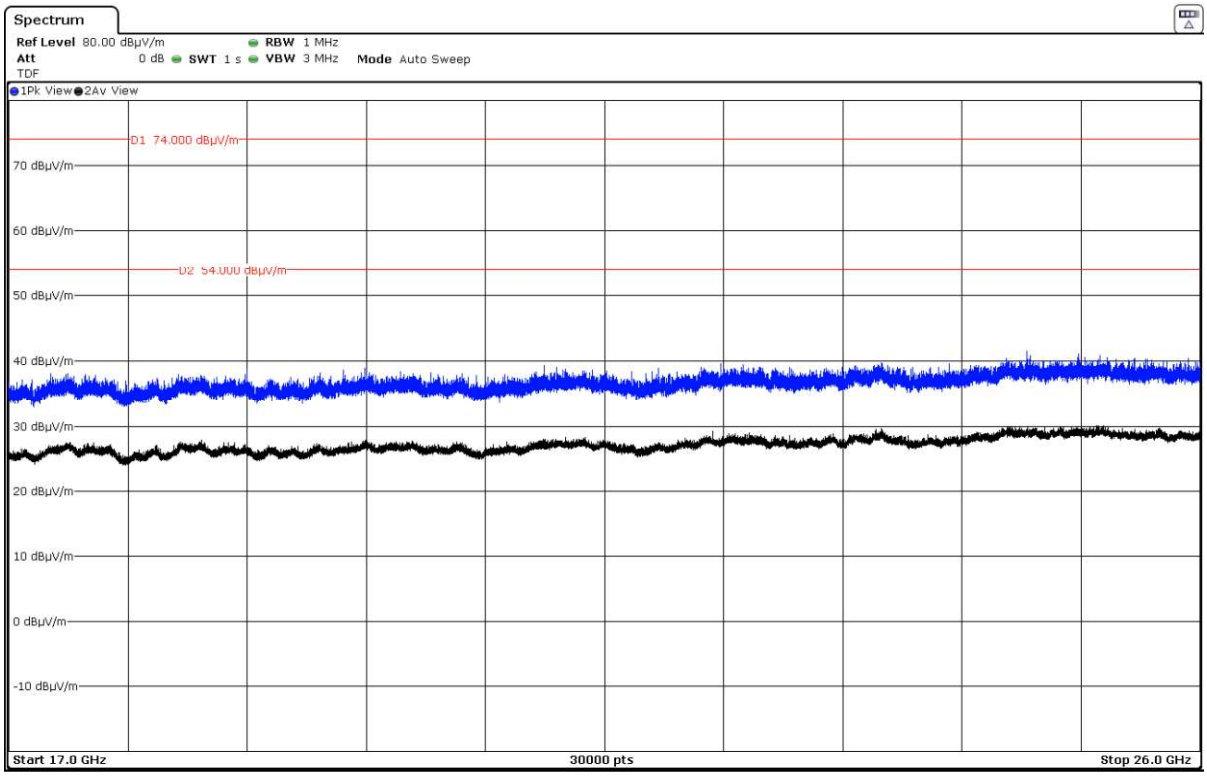


- High Channel:



FREQUENCY RANGE 17 - 26 GHz:

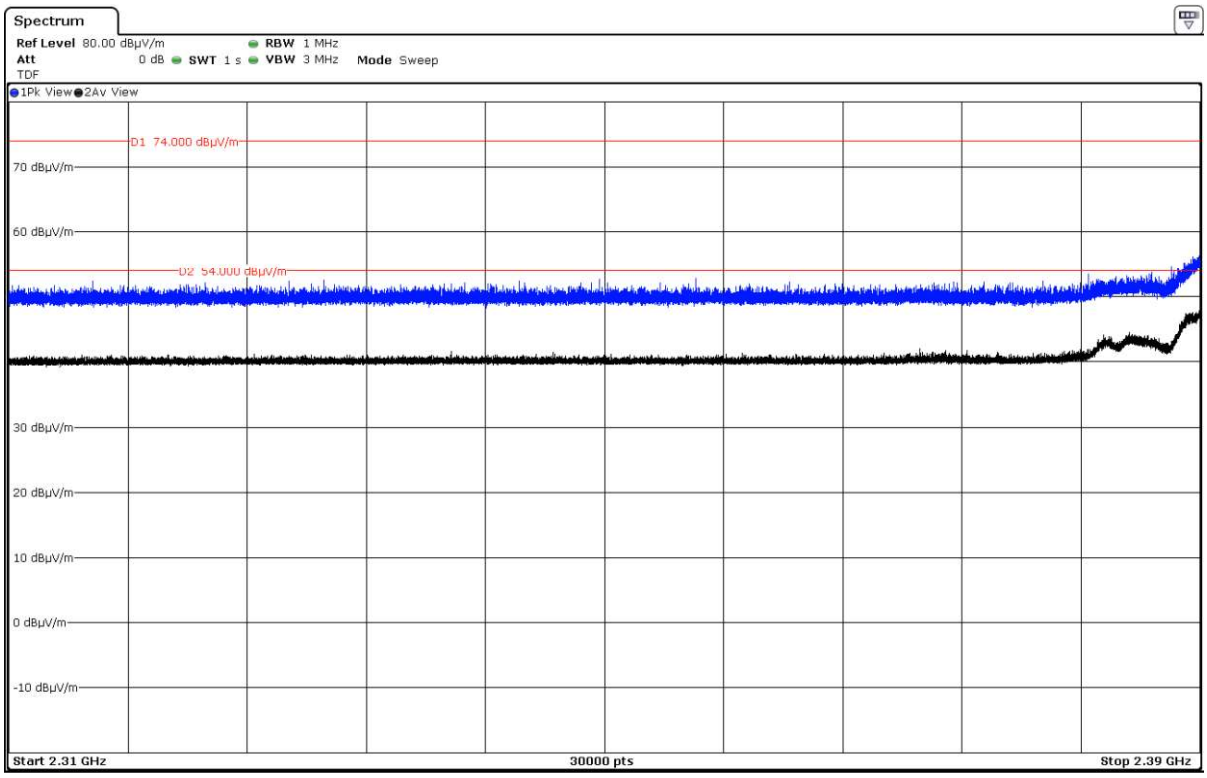
The spurious signals detected do not depend on the operating channel.



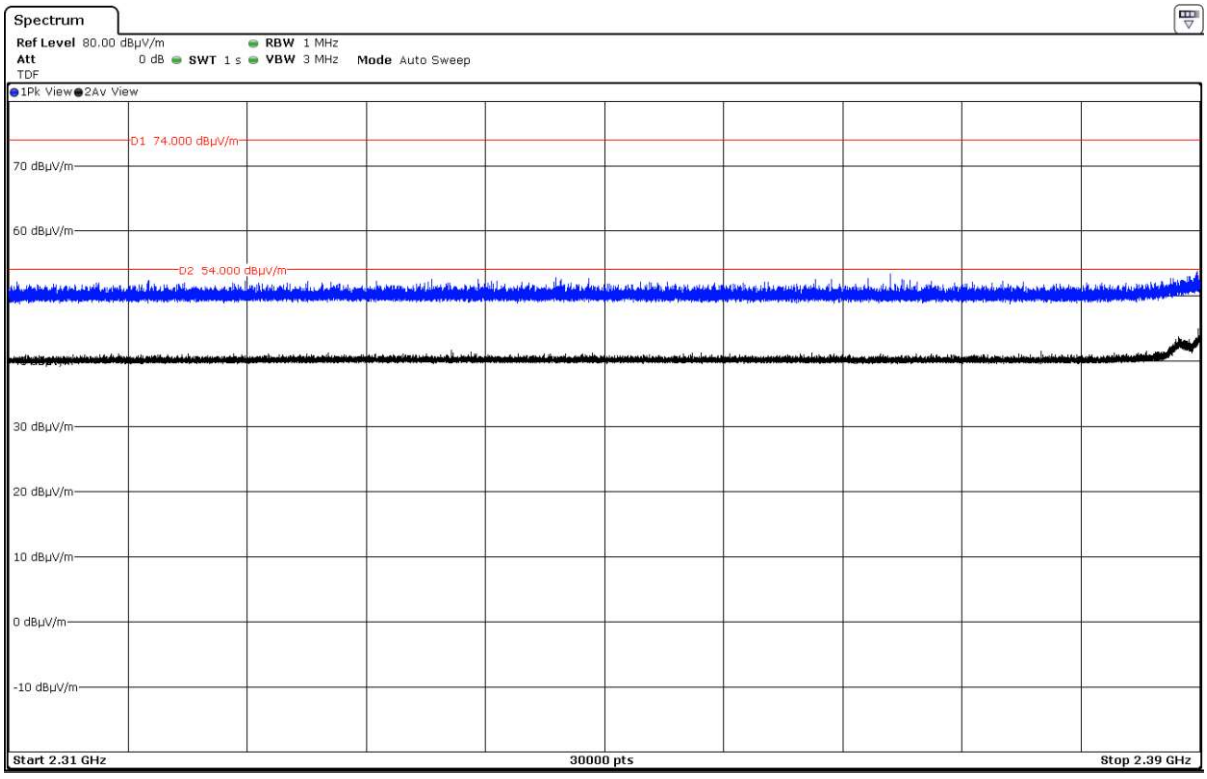
Note: This plot is valid for all three channels.

FREQUENCY RANGE 2.31-2.39 GHz (Restricted Band 1):

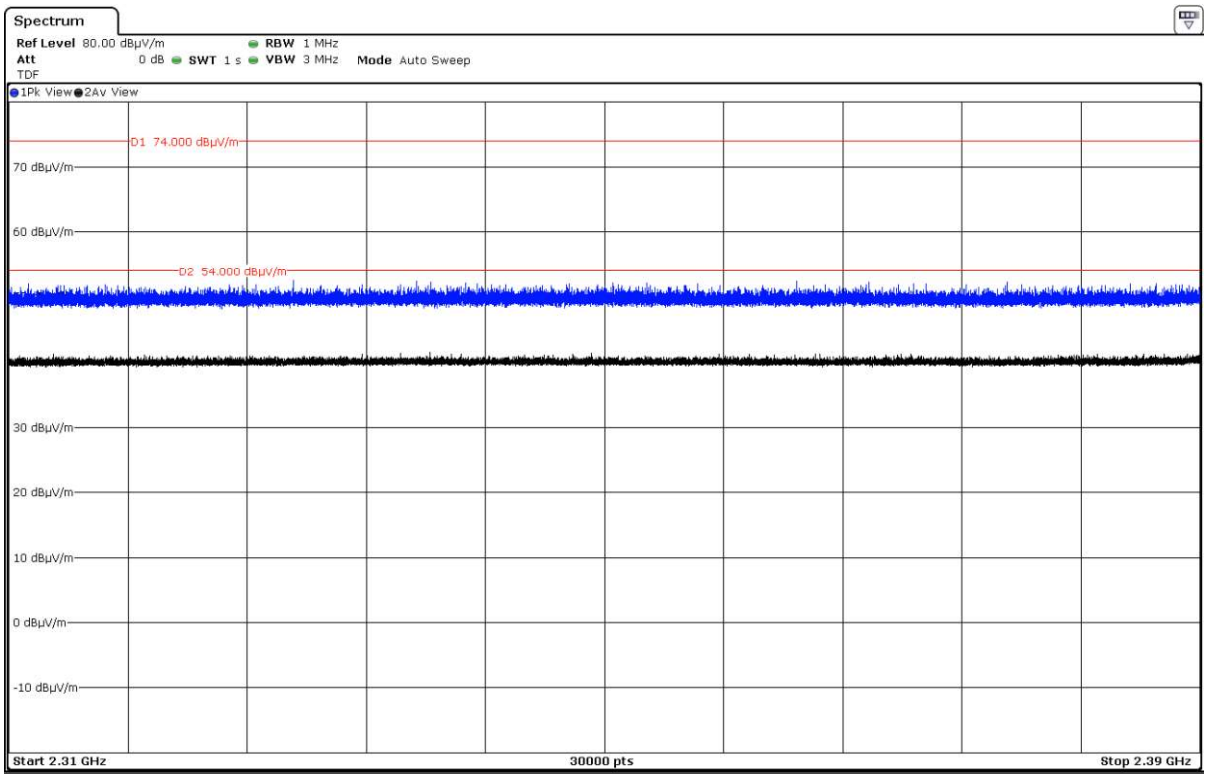
- Low Channel. CH 1:



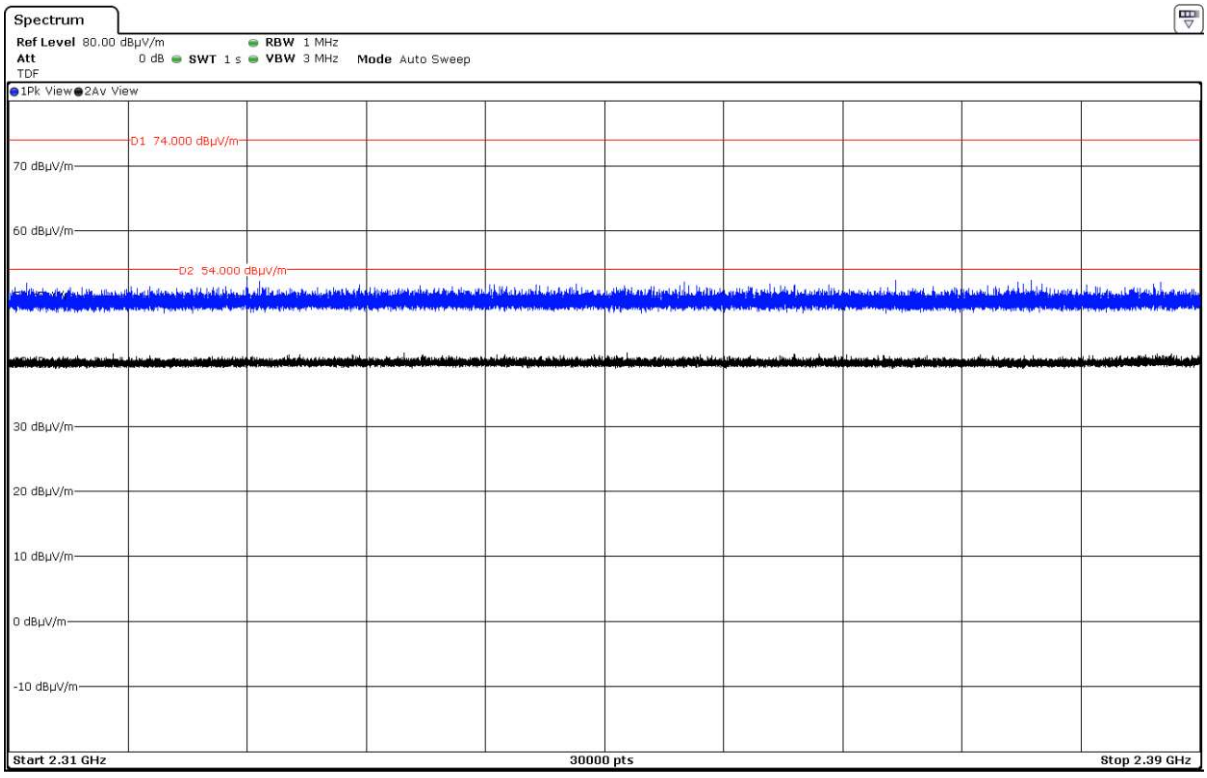
- CH 2:



- CH 3:

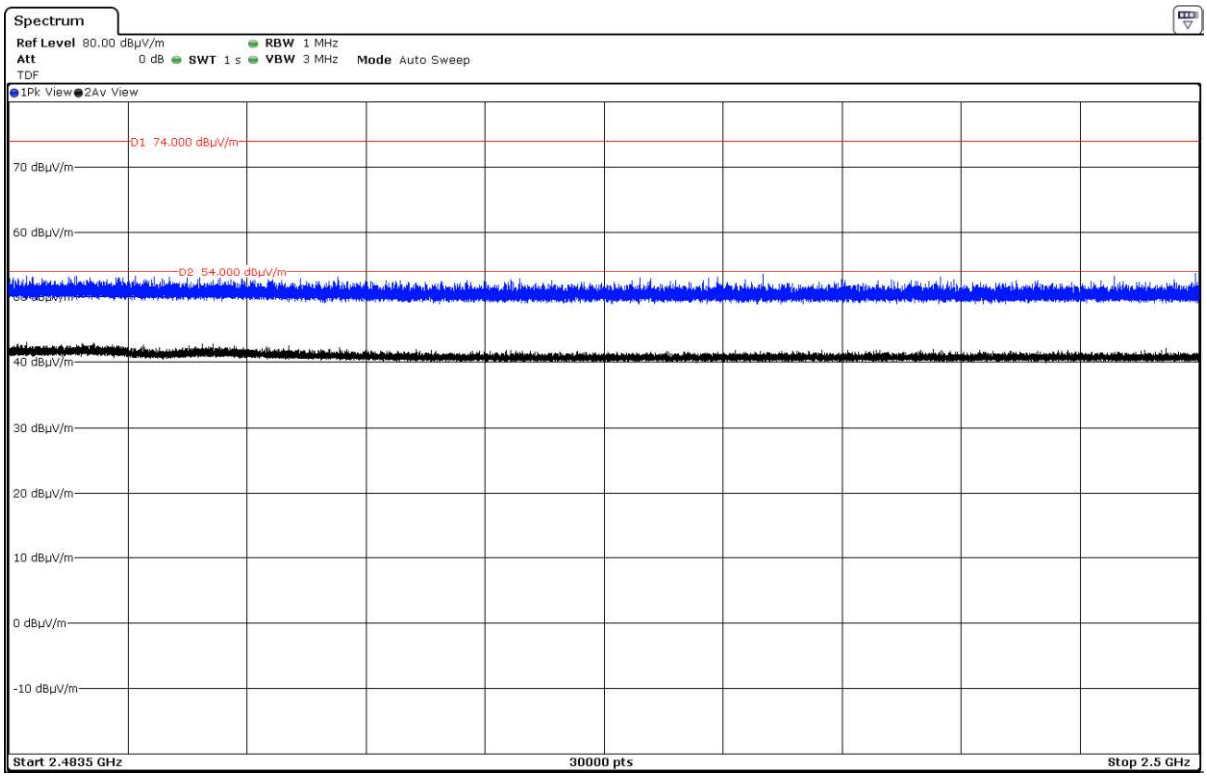

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
70 dBµV/m
60 dBµV/m
D2 54.000 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

- CH 4:

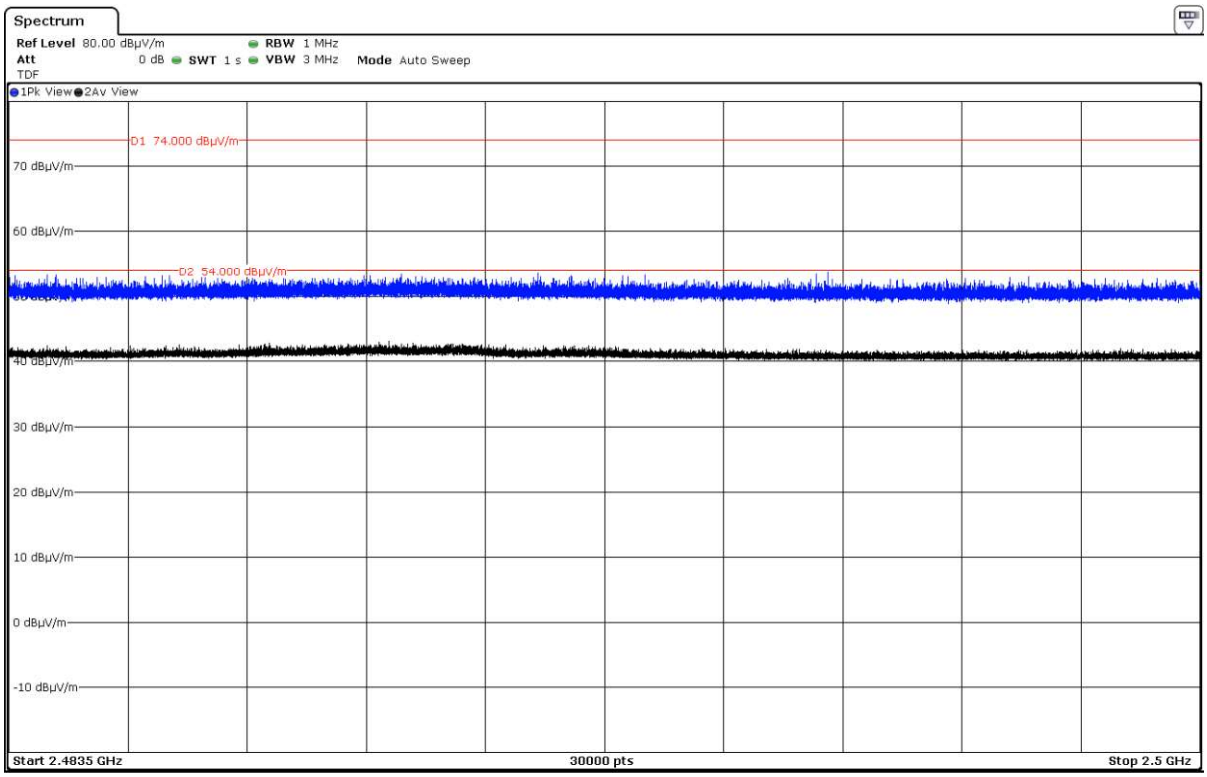

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
70 dBµV/m
60 dBµV/m
D2 54.000 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

FREQUENCY RANGE 2.4835-2.5 GHz (Restricted Band 2):

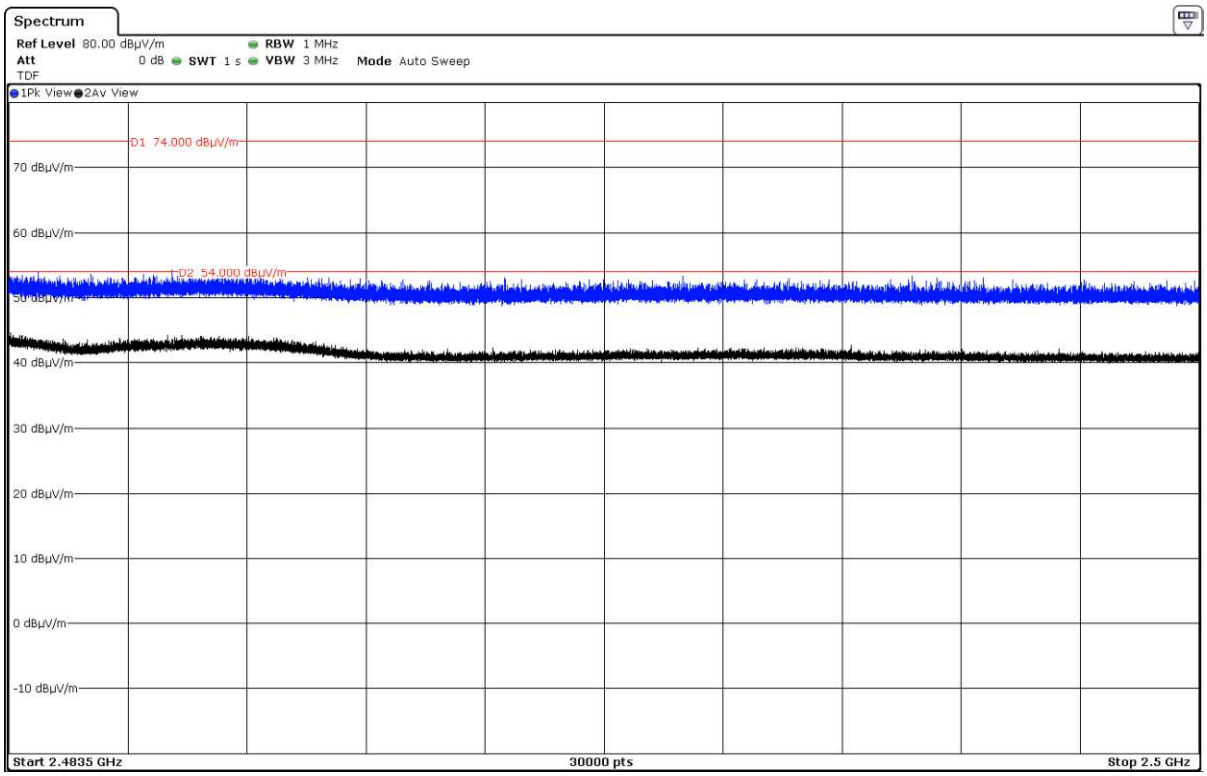
- CH 8:



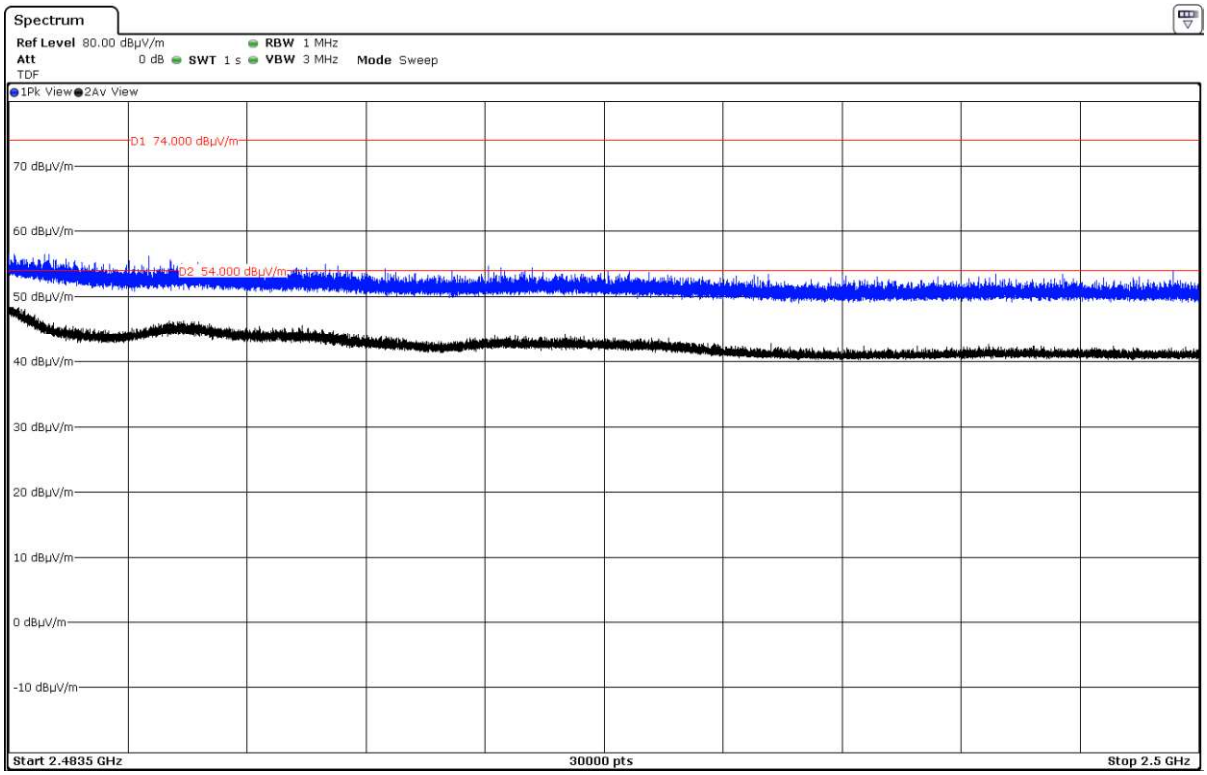
- CH 9:



- CH 10:



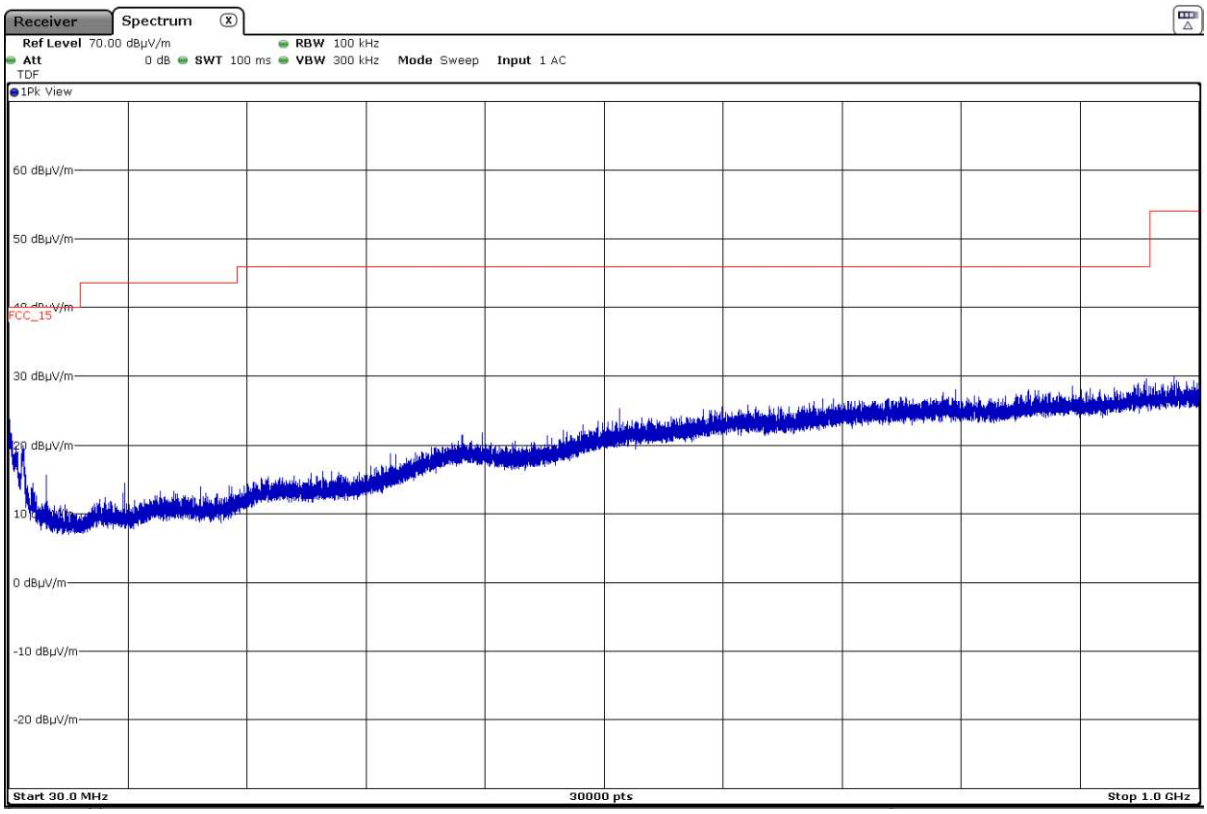
- High Channel. CH 11:



- **Mode 802.11 g (OFDM worst case for spurious emissions)**

FREQUENCY RANGE 30 MHz - 1 GHz:

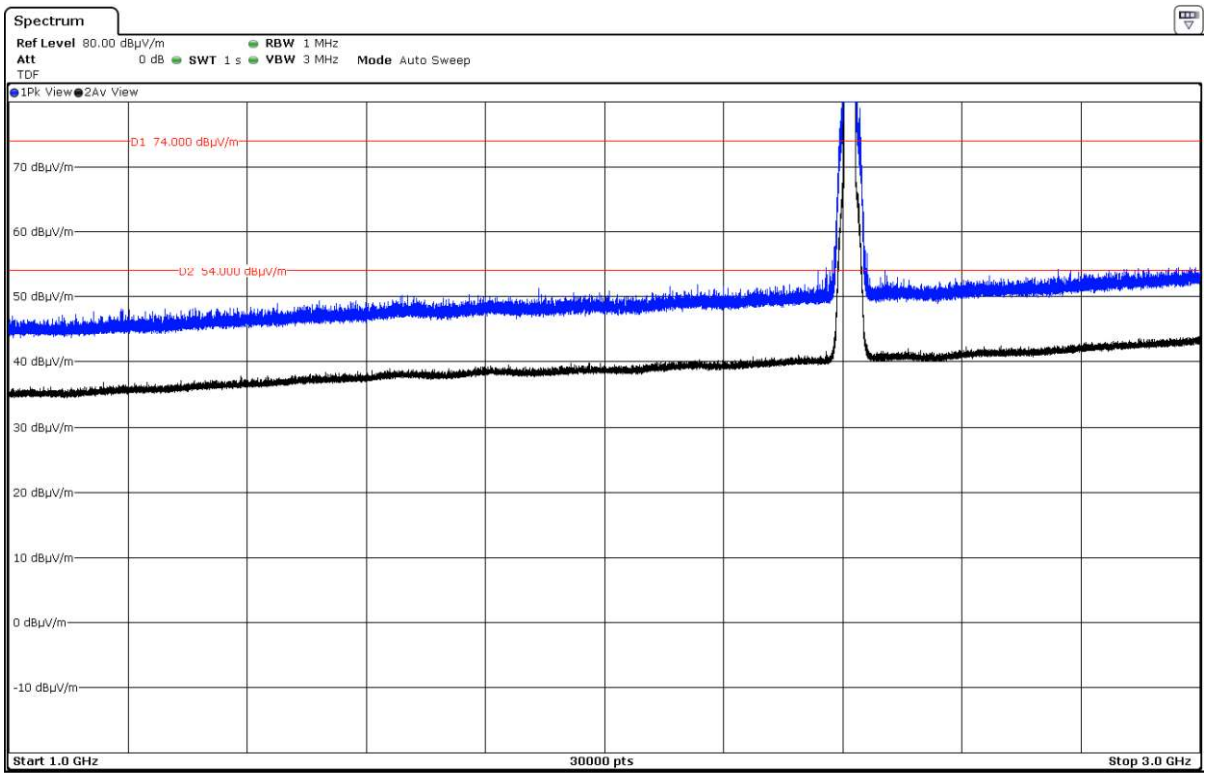
The spurious signals detected do not depend on the operating channel.



Note: This plot is valid for all three channels.

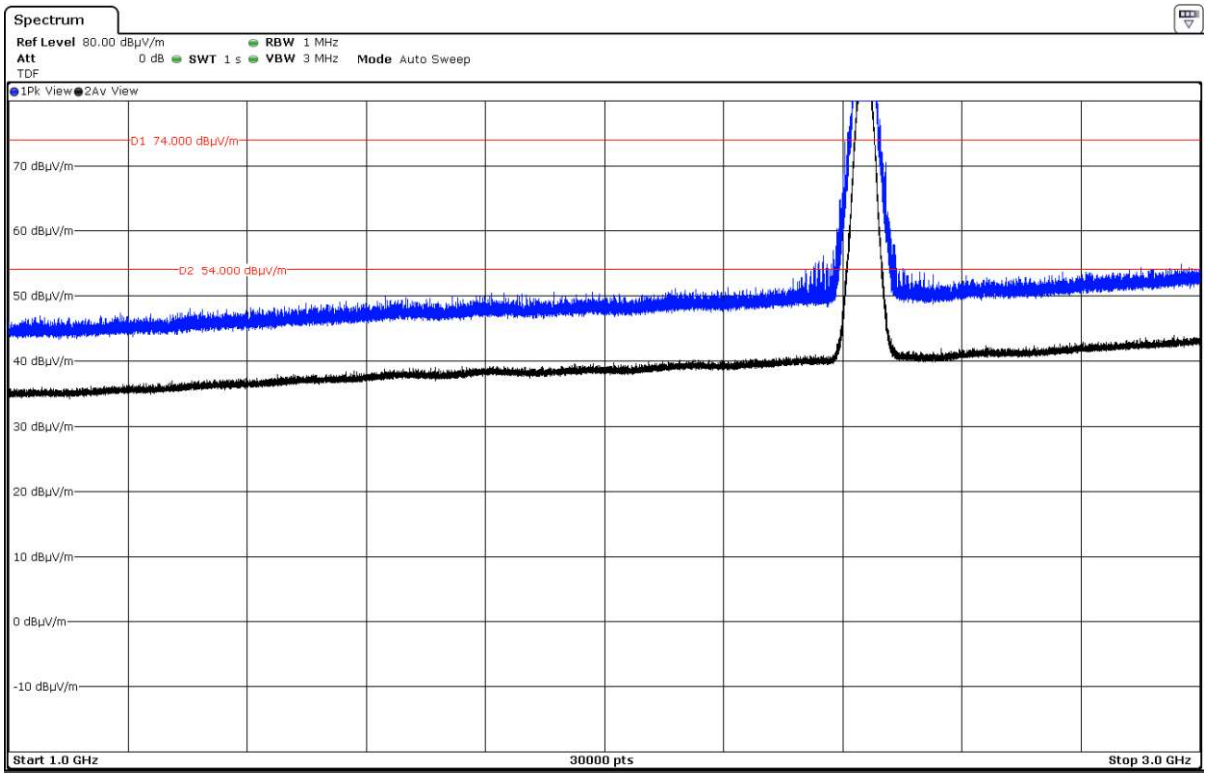
FREQUENCY RANGE 1 - 3 GHz:

- Low Channel:



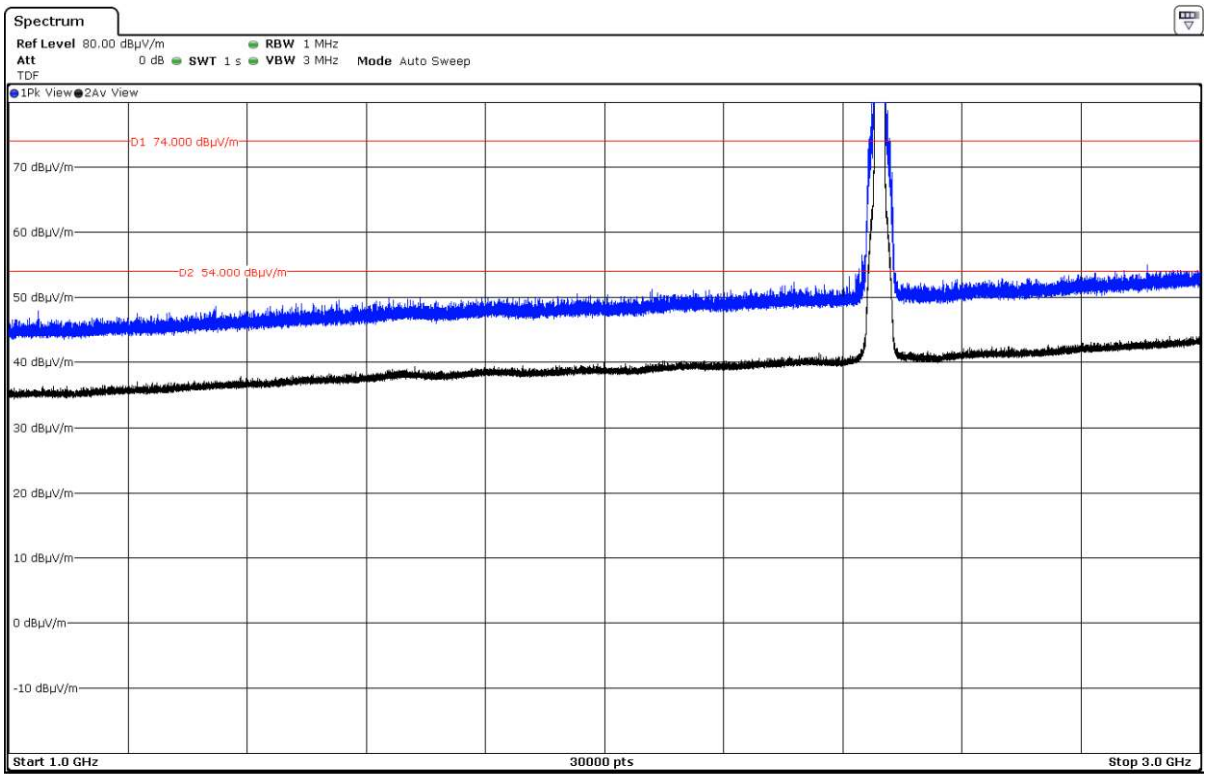
The peak above the limit is the carrier frequency.

- Middle Channel:



The peak above the limit is the carrier frequency.

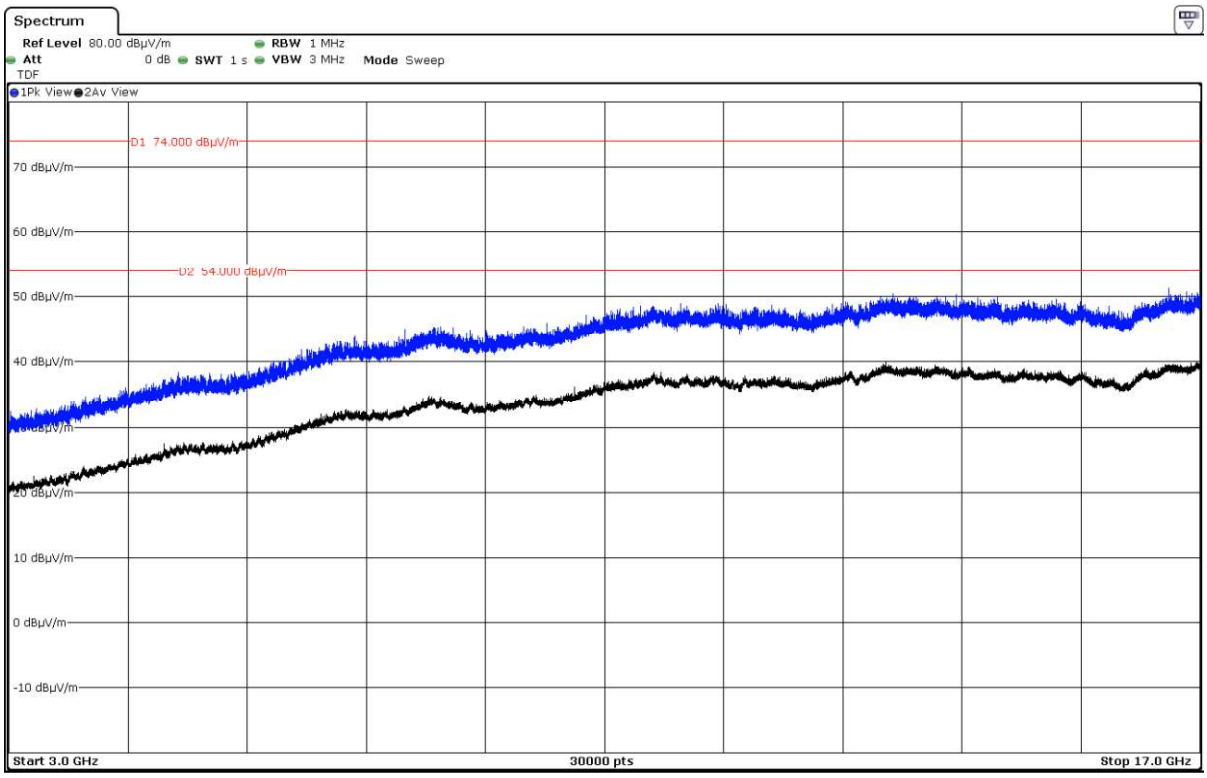
- High Channel:



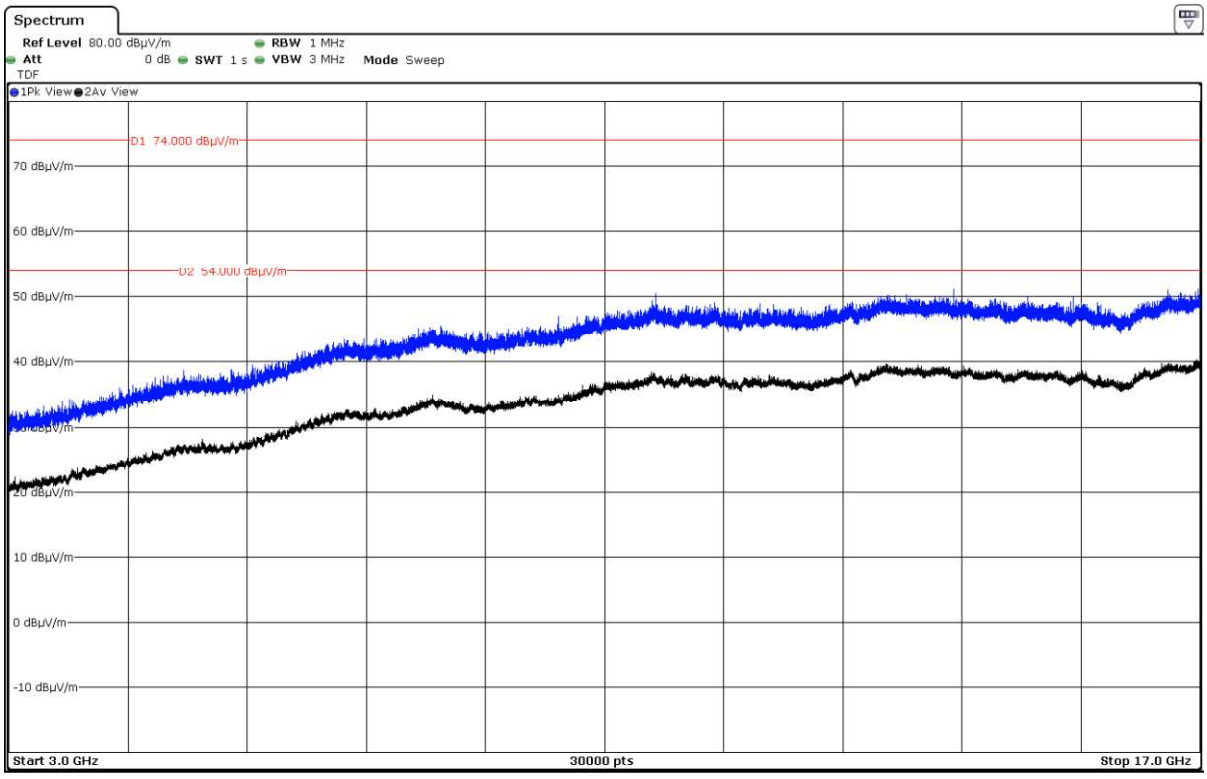
The peak above the limit is the carrier frequency.

FREQUENCY RANGE 3 - 17 GHz:

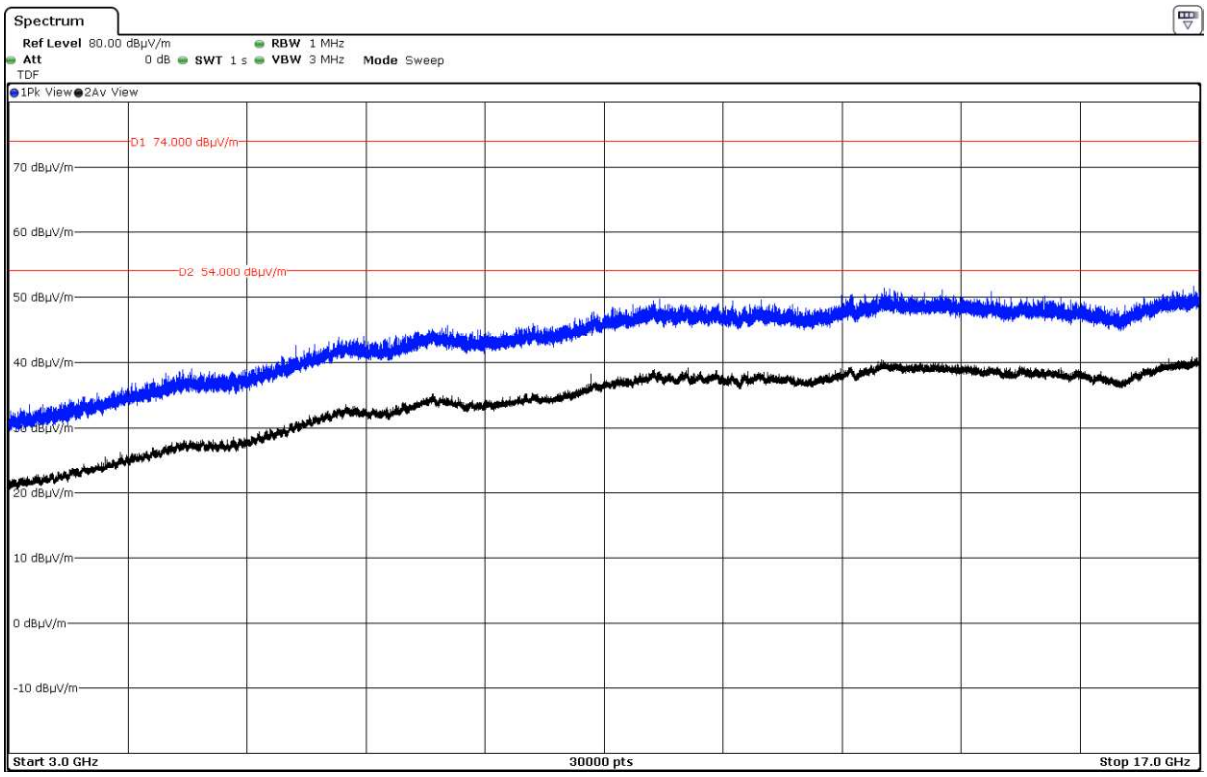
- Low Channel:



- Middle Channel:

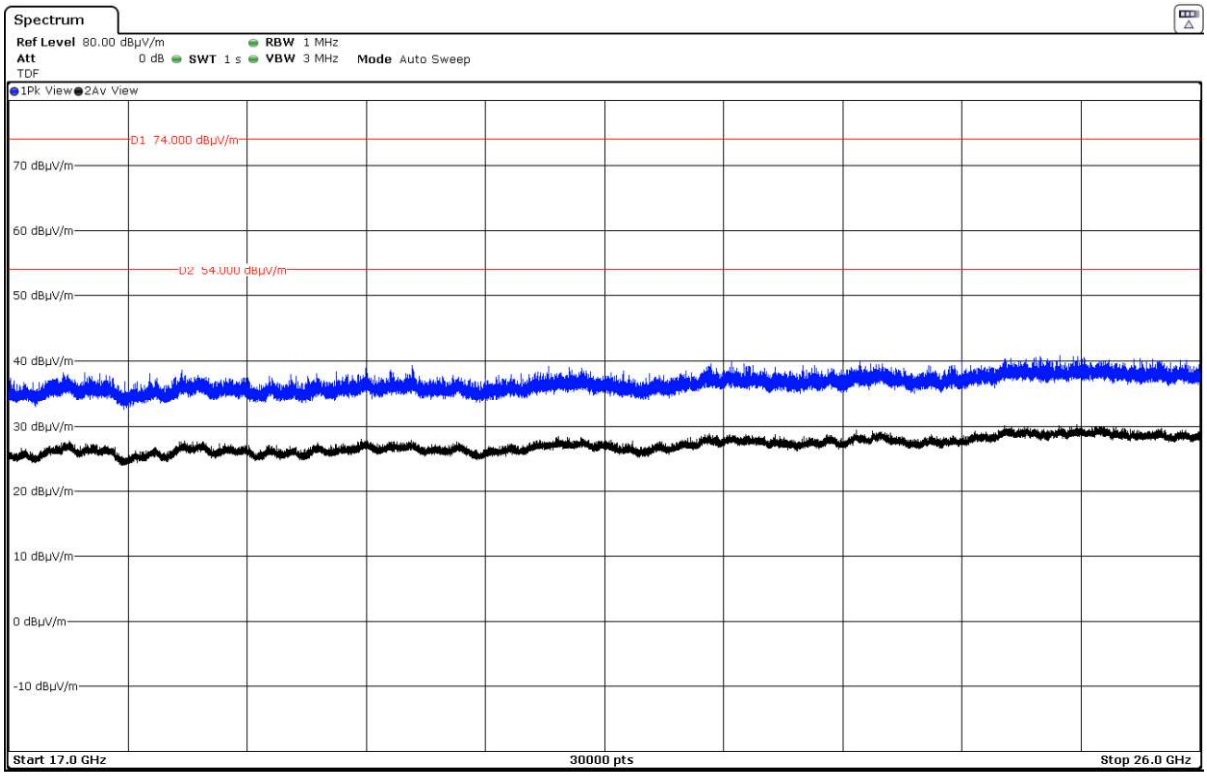


- High Channel:



FREQUENCY RANGE 17 - 26 GHz:

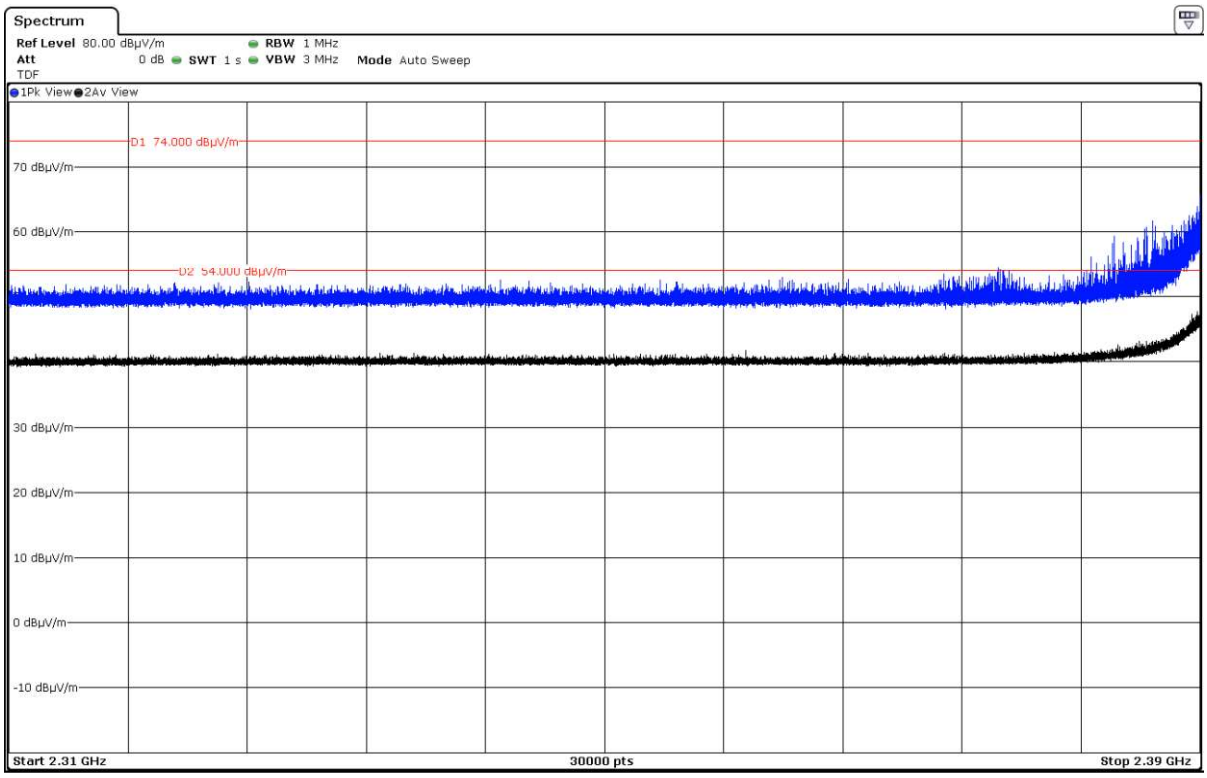
The spurious signals detected do not depend on the operating channel.



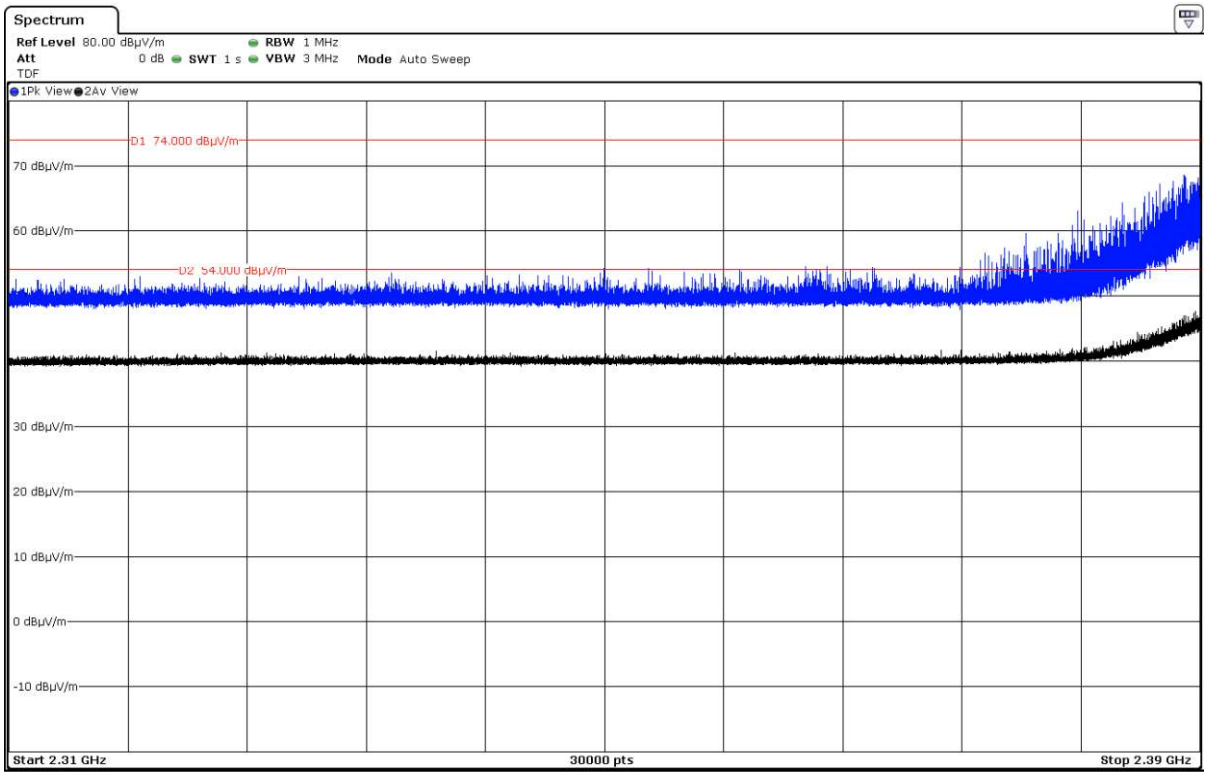
Note: This plot is valid for all three channels.

FREQUENCY RANGE 2.31-2.39 GHz (Restricted Band 1):

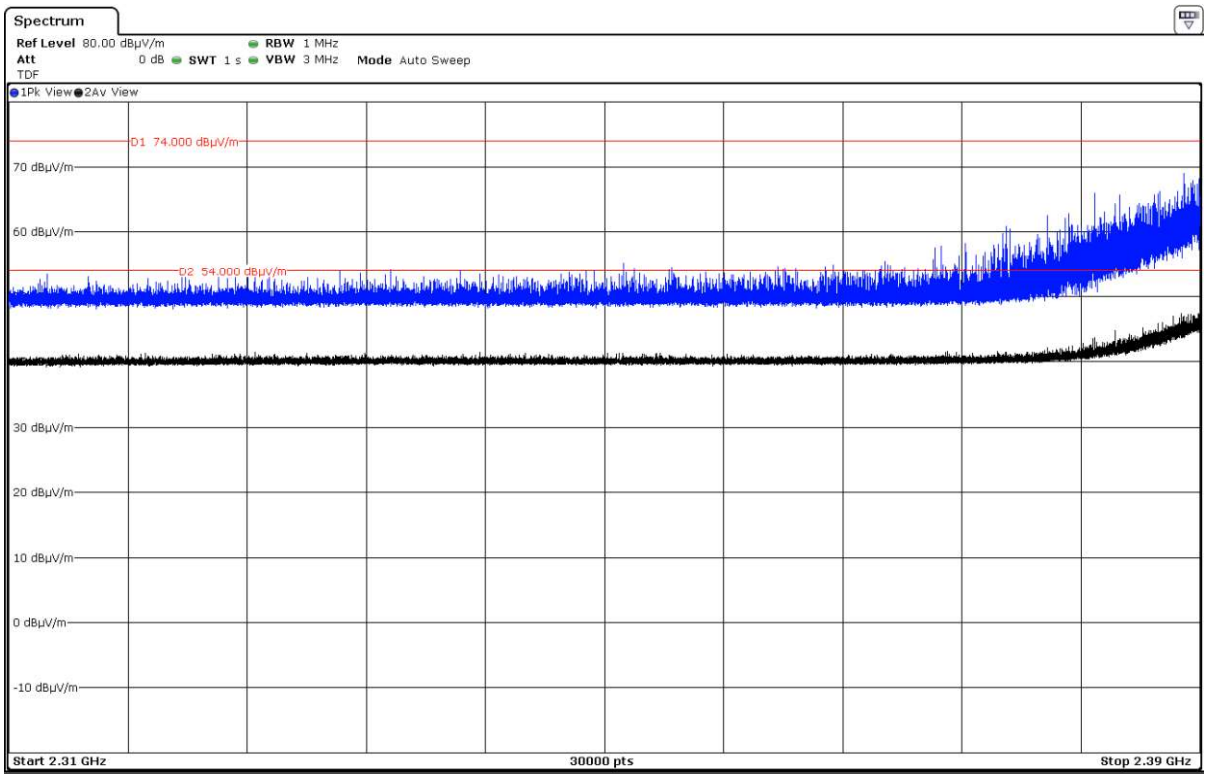
- Low Channel. CH 1:



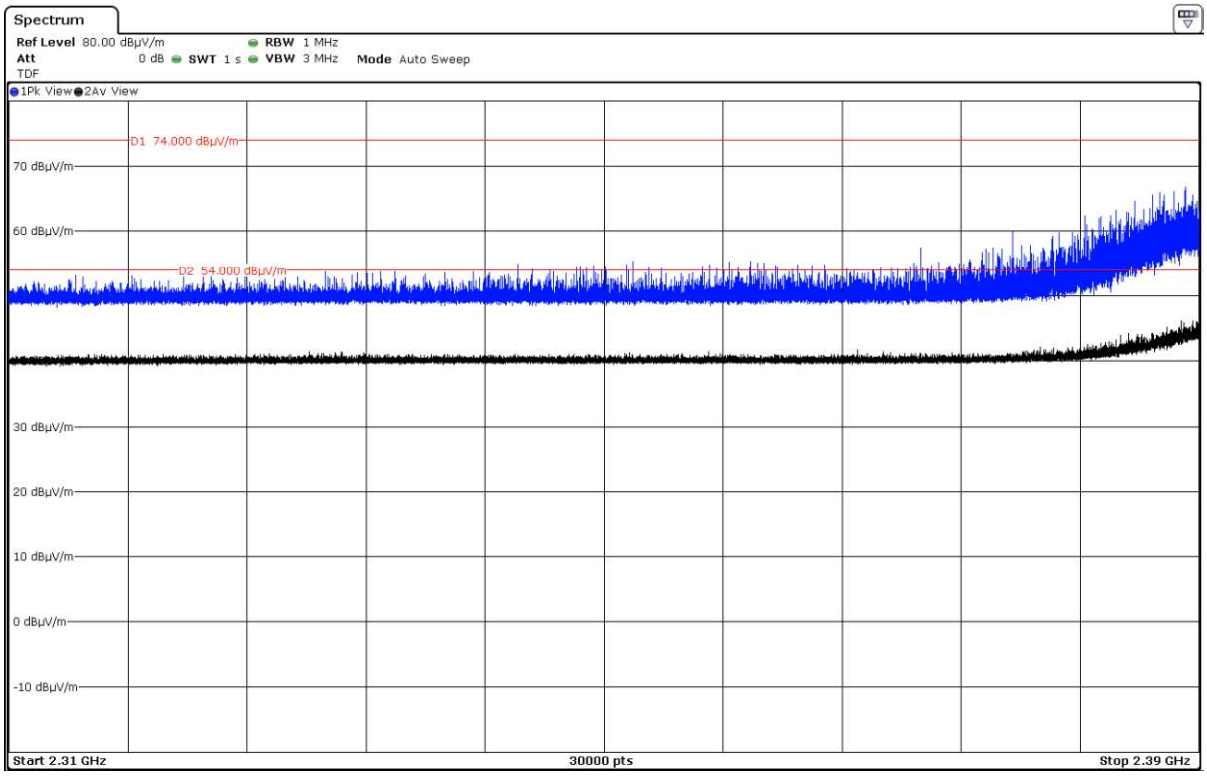
- CH 2:



- CH 3:

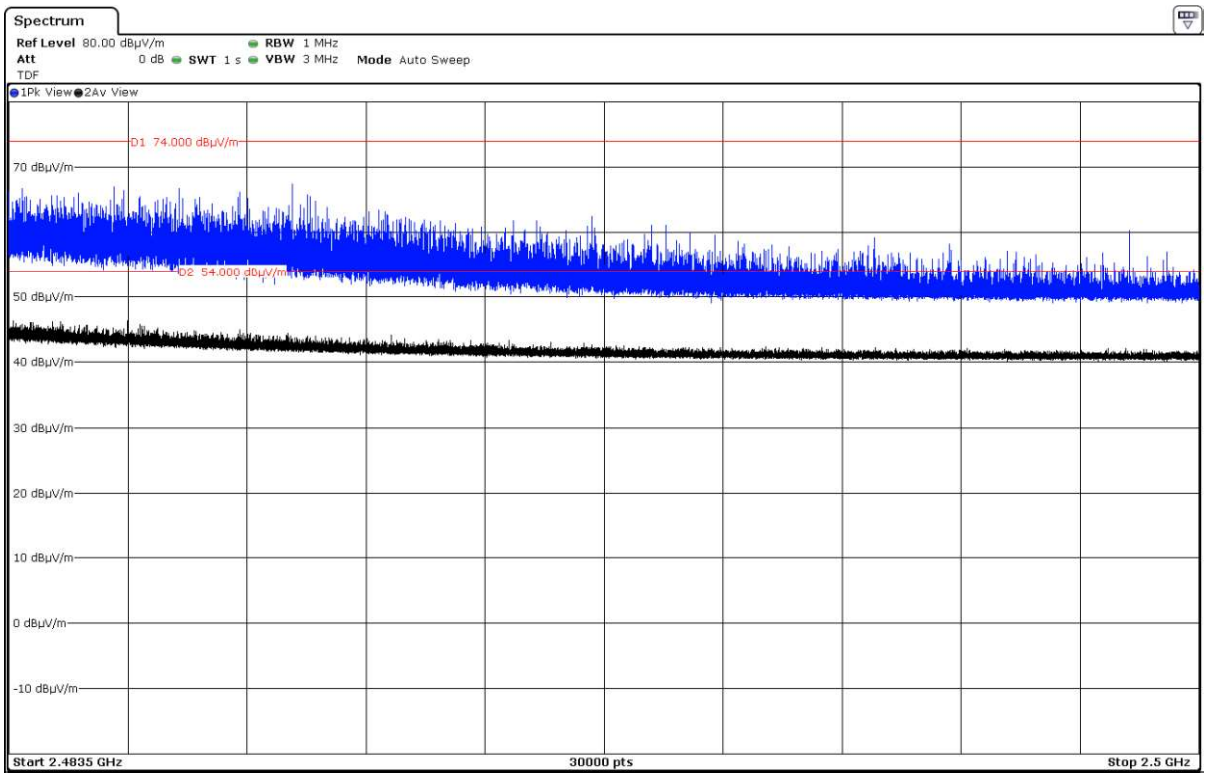

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
D2 54.000 dBµV/m
70 dBµV/m
60 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

- CH 4:

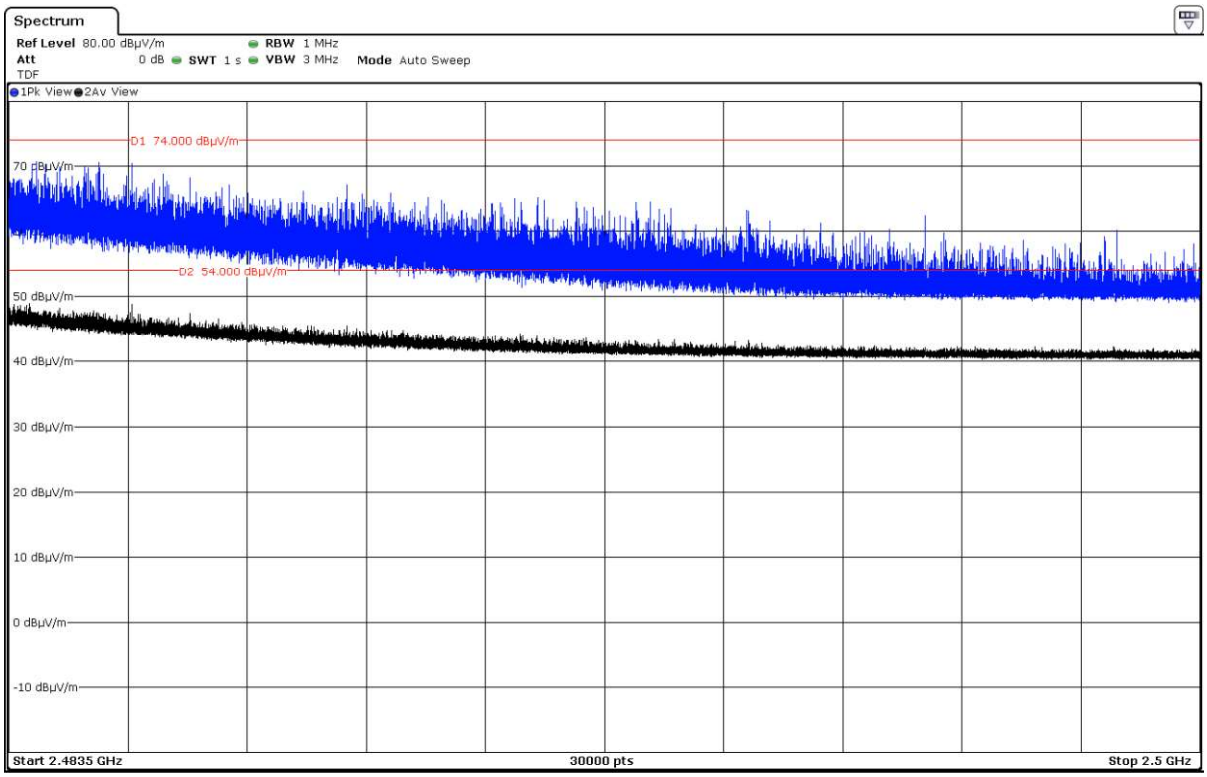

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
D2 54.000 dBµV/m
70 dBµV/m
60 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

FREQUENCY RANGE 2.4835-2.5 GHz (Restricted Band 2):

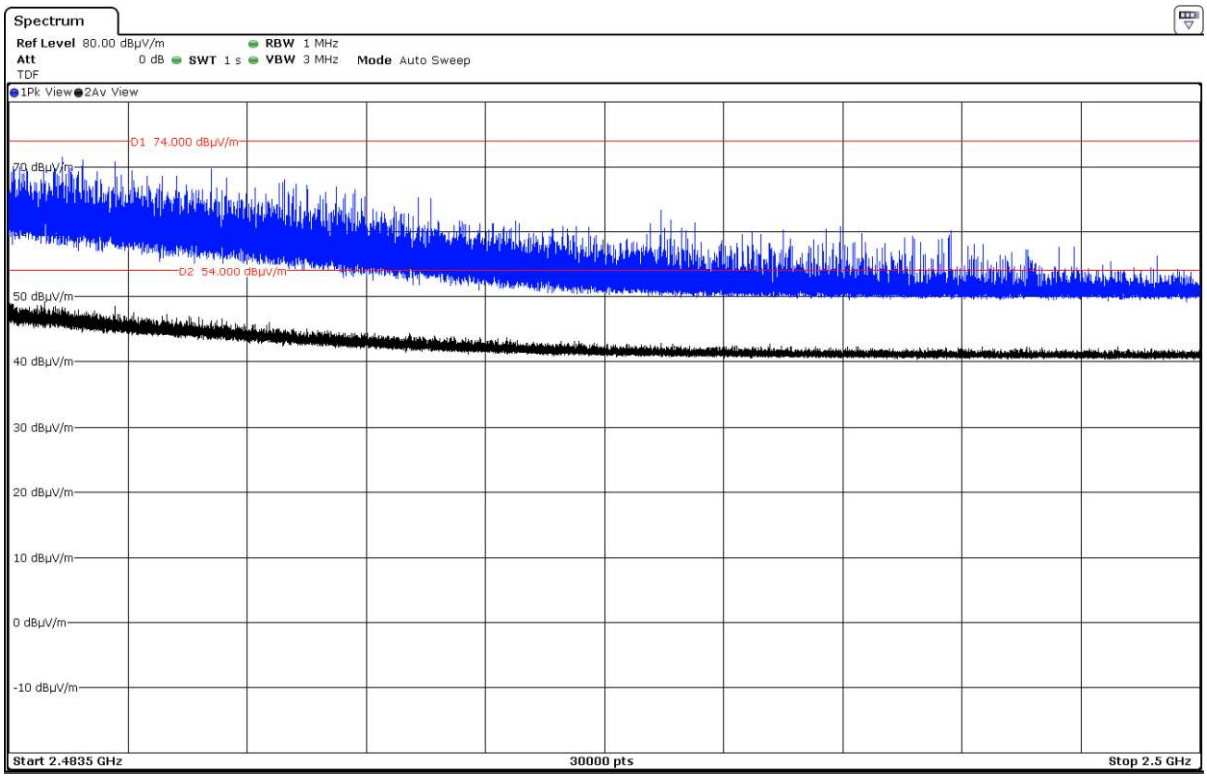
- CH 8:



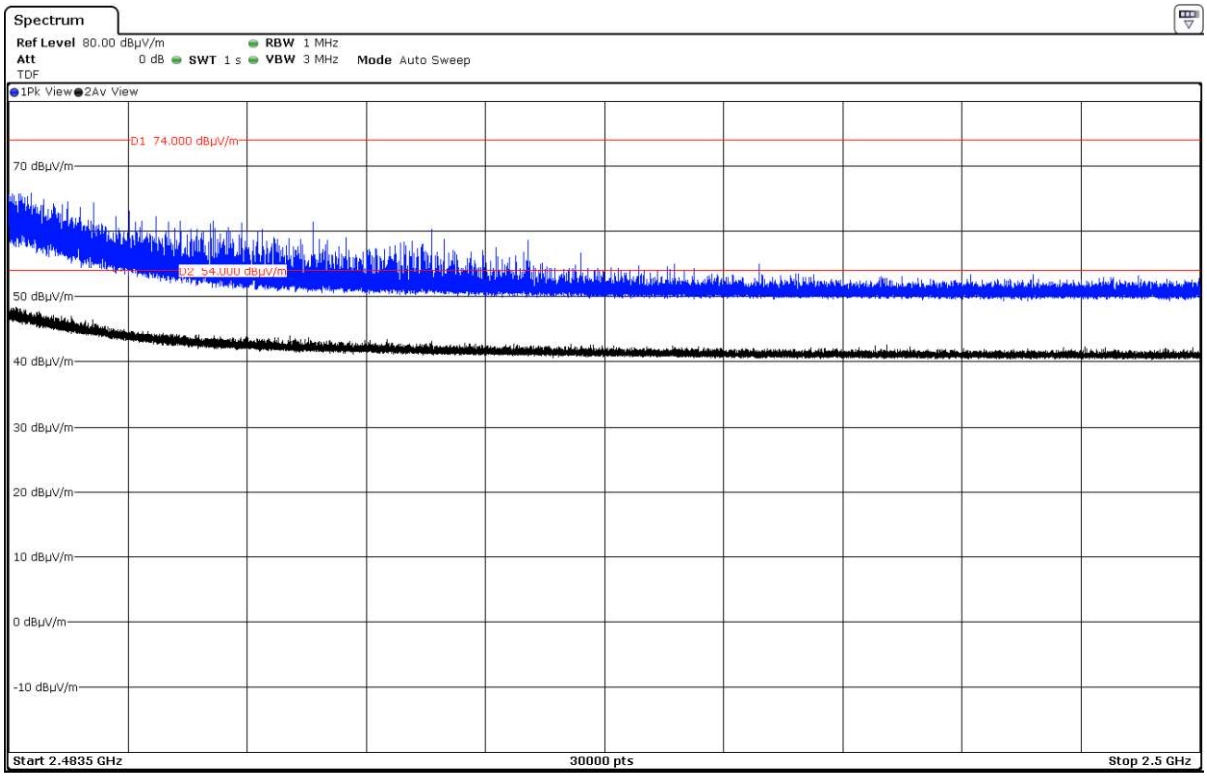
- CH 9:



- CH 10:



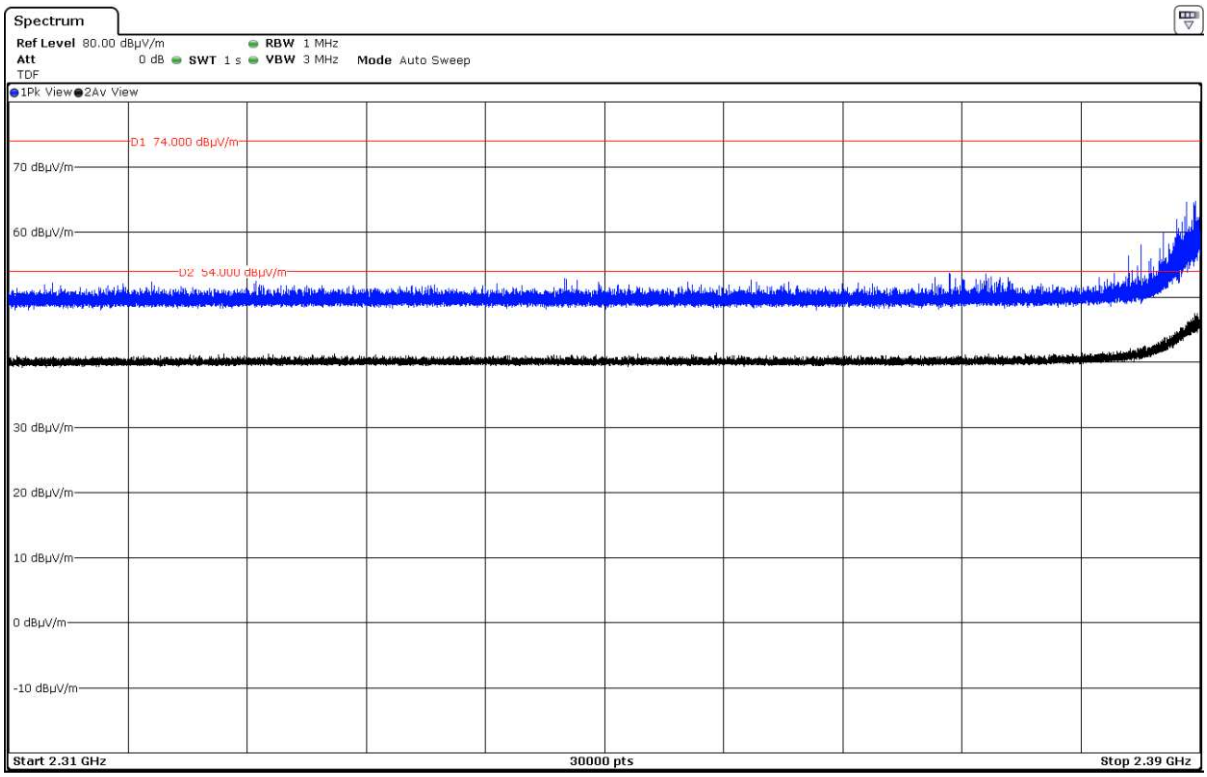
- High Channel. CH 11:



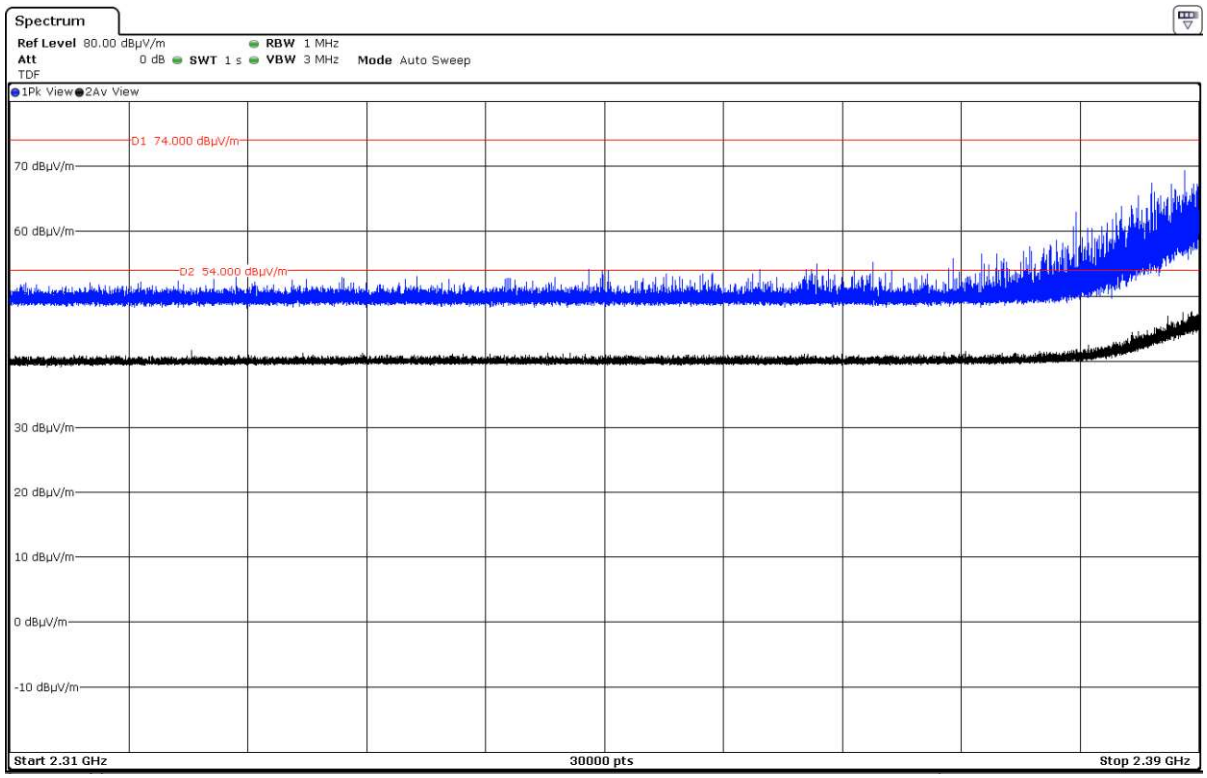
- **Mode 802.11 n20**

FREQUENCY RANGE 2.31-2.39 GHz (Restricted Band 1):

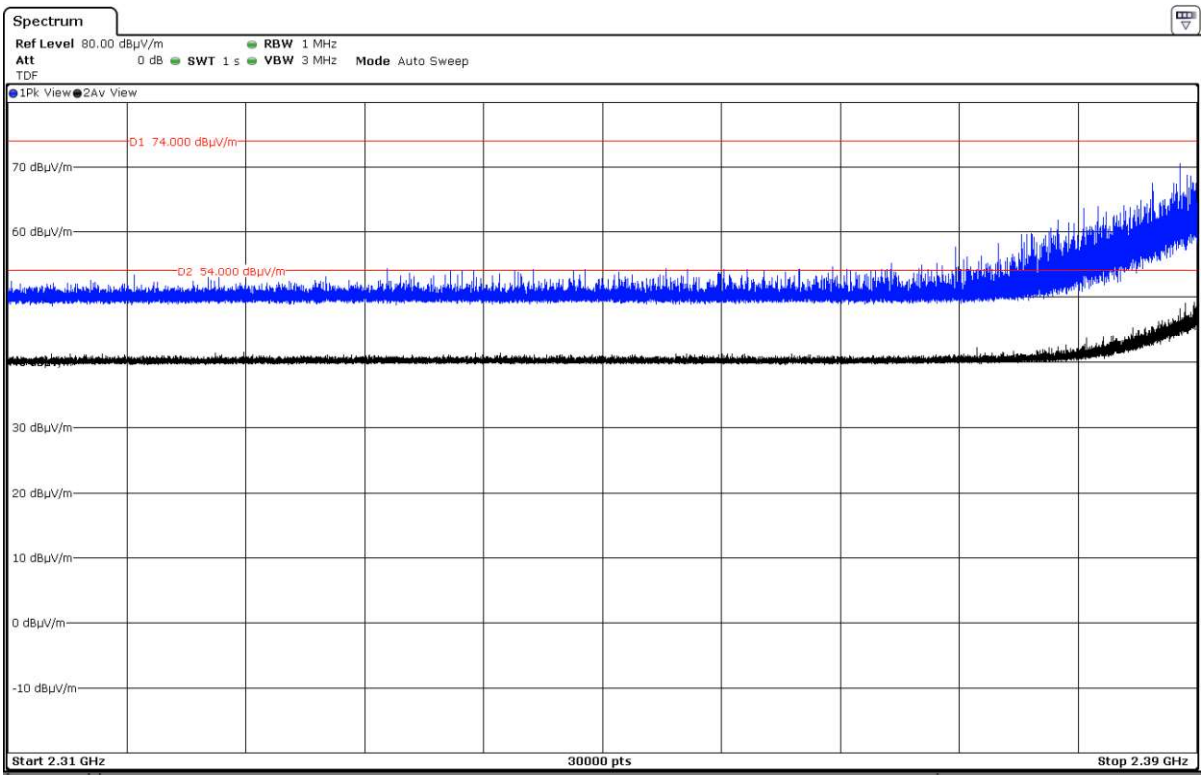
- Low Channel. CH 1:



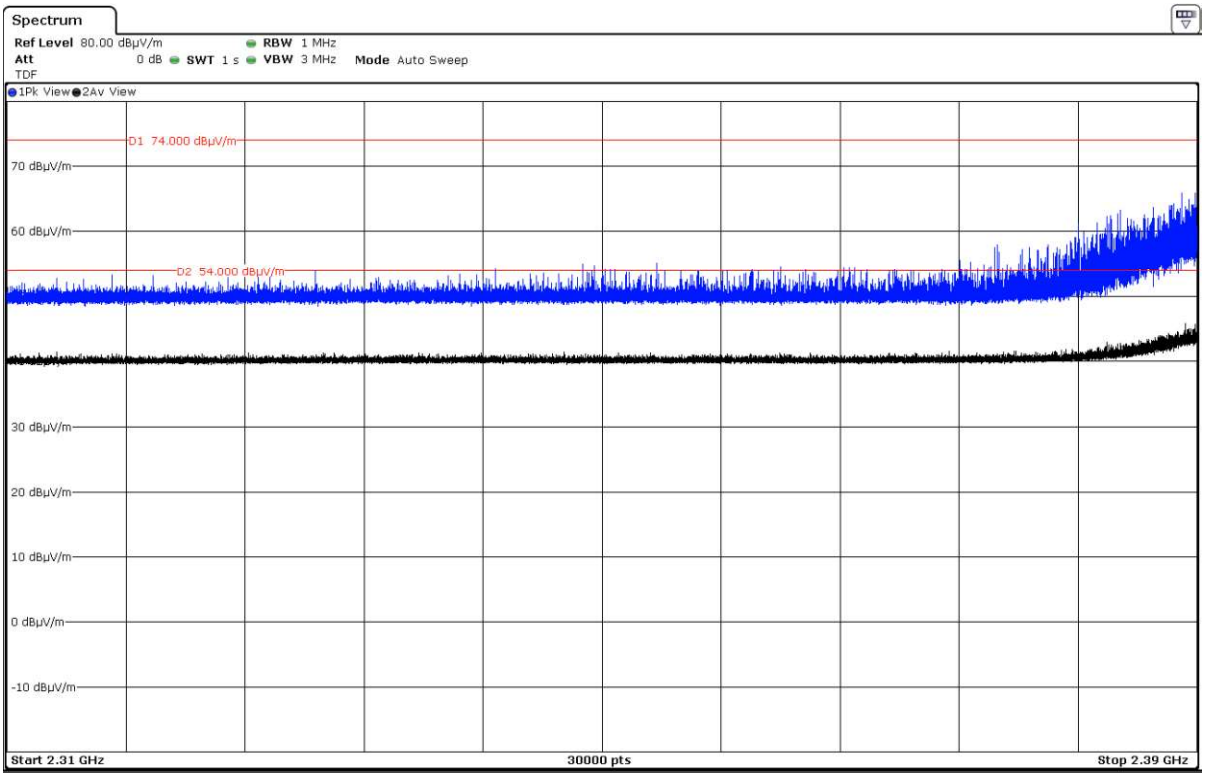
- CH 2:



- CH 3:

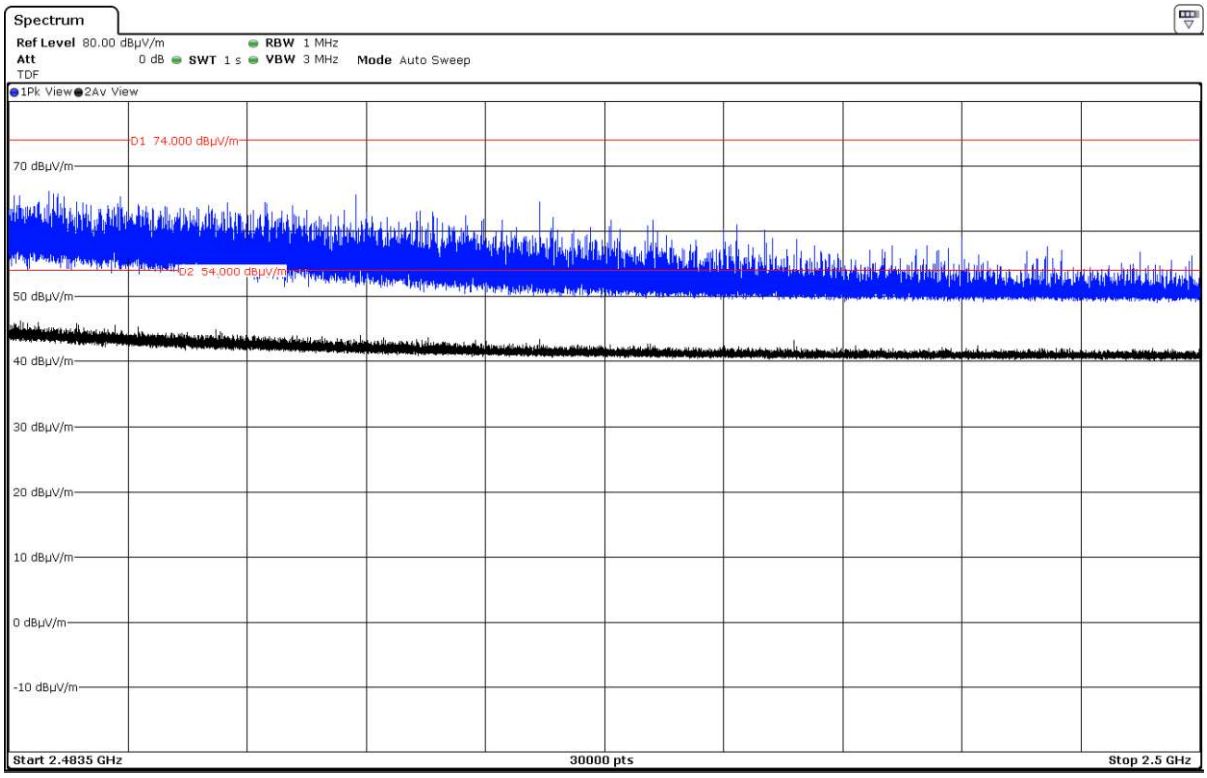

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
70 dBµV/m
60 dBµV/m
D2 54.000 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

- CH 4:

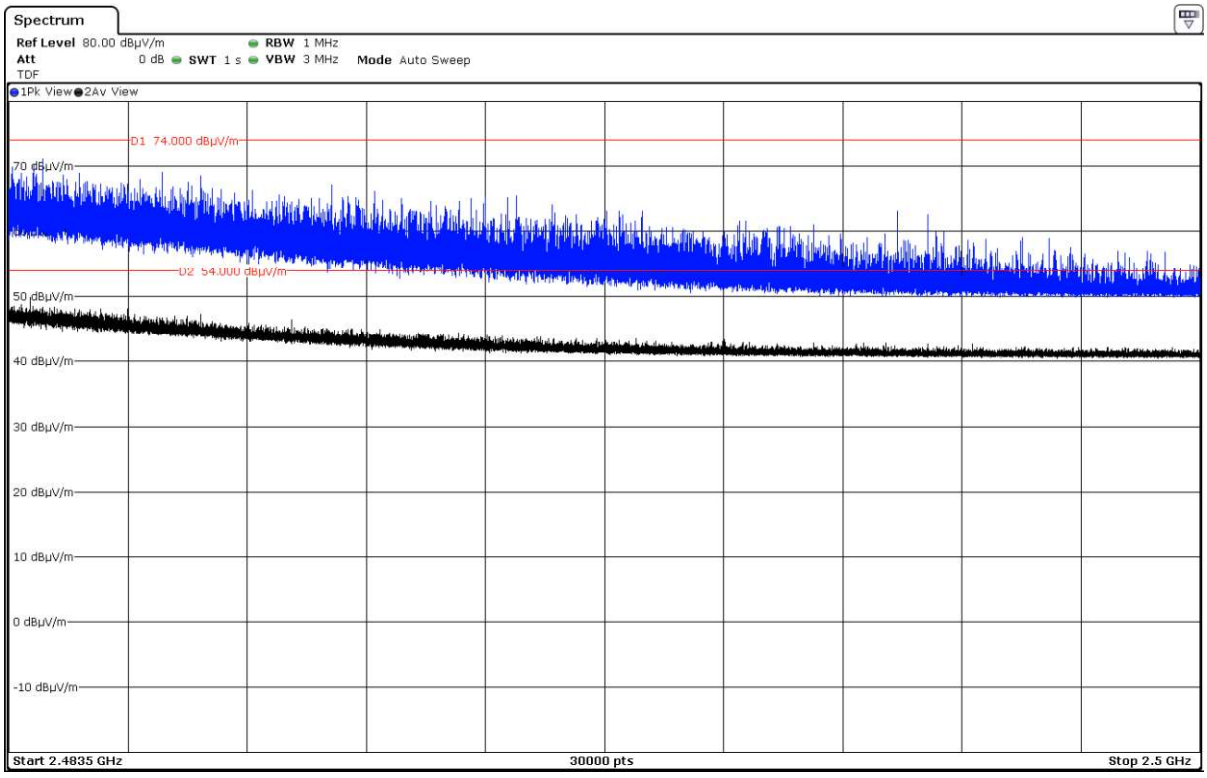

Spectrum
Ref Level 80.00 dBµV/m
RBW 1 MHz
Att 0 dB SWT 1 s VBW 3 MHz Mode Auto Sweep
TDF
1Pk View 2Av View
D1 74.000 dBµV/m
70 dBµV/m
60 dBµV/m
D2 54.000 dBµV/m
30 dBµV/m
20 dBµV/m
10 dBµV/m
0 dBµV/m
-10 dBµV/m
Start 2.31 GHz
30000 pts
Stop 2.39 GHz

FREQUENCY RANGE 2.4835-2.5 GHz (Restricted Band 2):

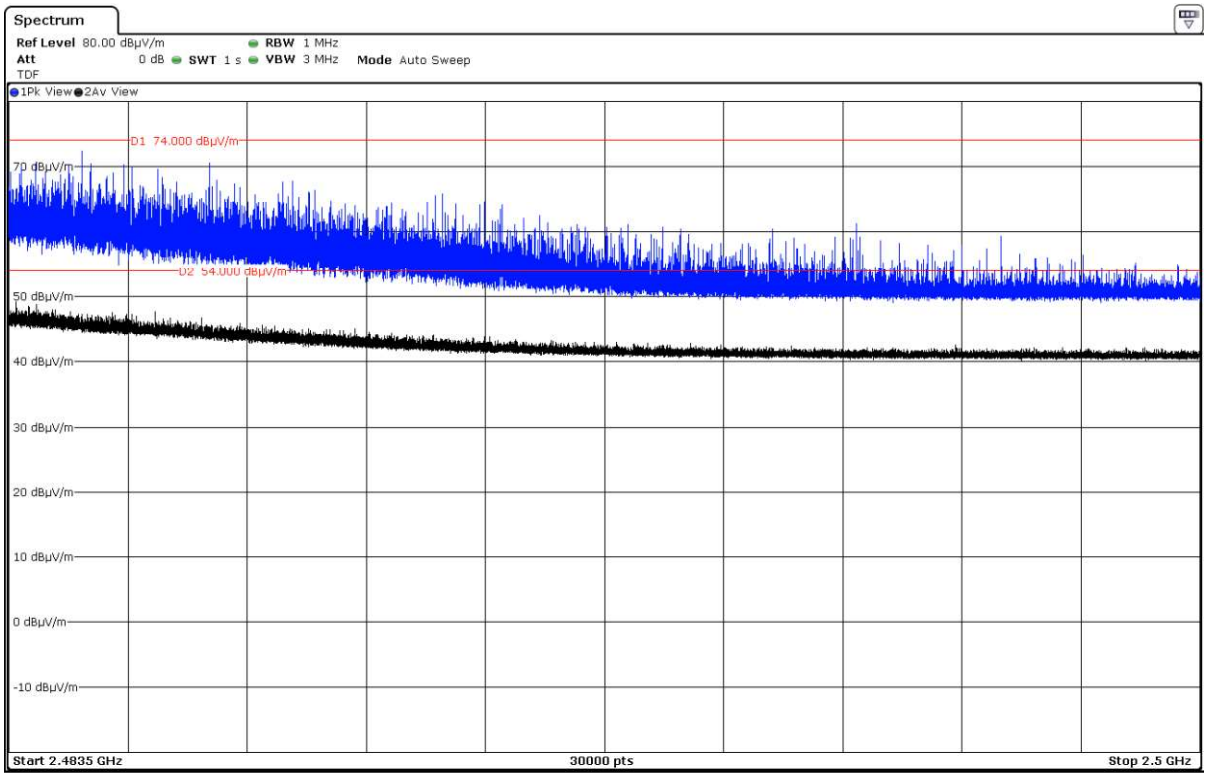
- CH 8:



- CH 9:



- CH 10:



- High Channel. CH 11: