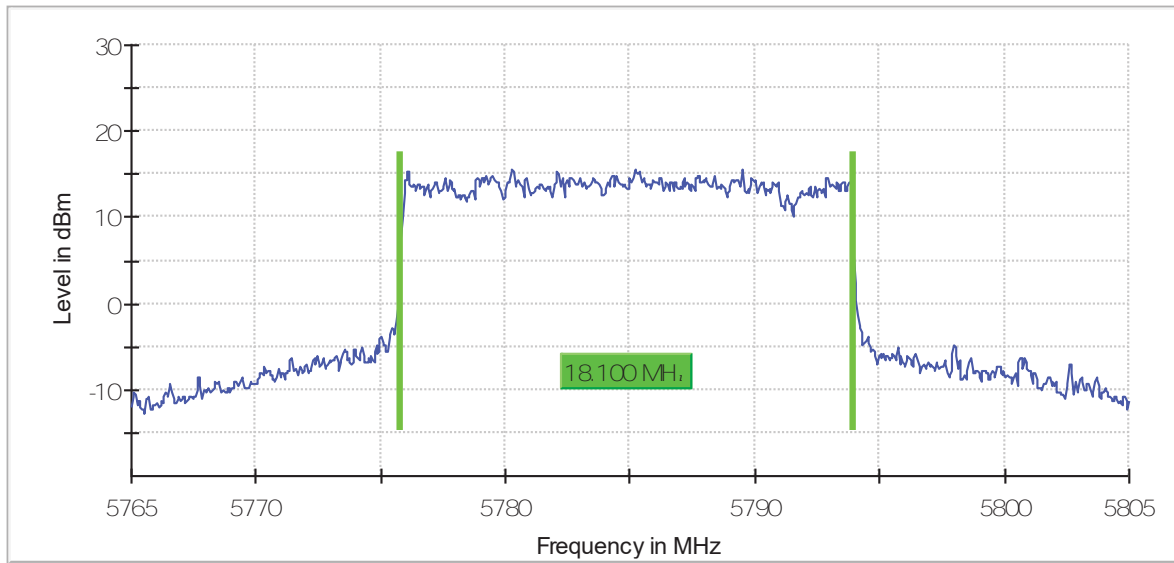


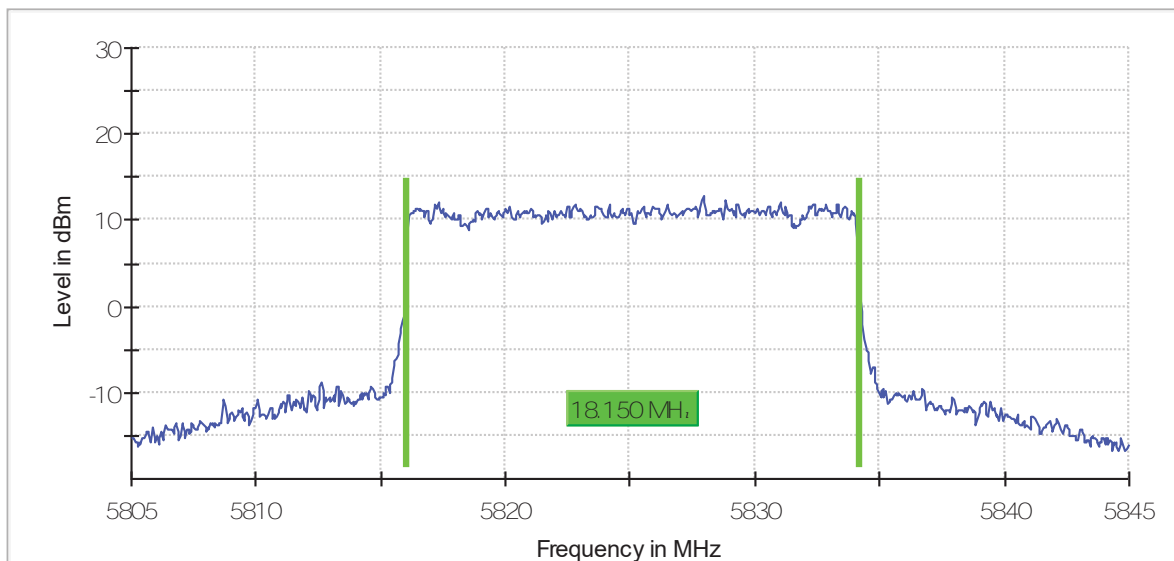
### Channel 157

6.4 B B . . . . .



### Channel 165

6.4 B B . . . . .



## FCC Section 15.407 Subclause (a)(3). / RSS-247 Clause 6.2.4.1. Transmitter Maximum Conducted Output Power

### **SPECIFICATION**

**FCC 15.407/RSS-247:** For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1W (30 dBm). If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **RESULTS:**

The maximum conducted output power was measured using the channel power integration method according to point E) 2) b) (Method SA-1) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is >98% and the channel power integration method according to point E) 2) d) (Method SA-2) of 789033 D02 General UNII Test Procedures New Rules v02r01 when the duty cycle is <98%.

In the measure-and-sum approach for MIMO mode, the conducted emission level (*e.g.*, transmit power or power in specified bandwidth) is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically to determine the total emission level from the device. Summing is performed in linear power units (mW—not dBm).

The e.i.r.p. levels are calculated by adding the corresponding antenna gain (dBi).

**FCC and Canada power setting**

**Mode: QPSK – 20 MHz**

Declared antenna gain: 6 dBi

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
Max. conducted power (dBm)	26.76	28.82	28.51
Conducted Power Limit (dBm)	30		
Margin (dB)	3.24	1.18	1.49
Maximum EIRP power (dBm)	32.76	34.82	34.51
EIRP power Limit (dBm)	36		
Margin (dB)	3.24	1.18	1.49
Measurement uncertainty (dB)	<±1.20		

**Mode: 16QAM – 20MHz**

Declared antenna gain: 6 dBi

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
Max. conducted power (dBm)	26.79	28.97	28.59
Conducted Power Limit (dBm)	30		
Margin (dB)	3.21	1.03	1.41
Maximum EIRP power (dBm)	32.79	34.97	34.59
EIRP power Limit (dBm)	36		
Margin (dB)	3.21	1.03	1.41
Measurement uncertainty (dB)	<±1.20		

**Mode: 64QAM – 20 MHz**

Declared antenna gain: 6 dBi

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
Max. conducted power (dBm)	26.82	29.12	28.67
Conducted Power Limit (dBm)	30		
Margin (dB)	3.18	0.88	1.33
Maximum EIRP power (dBm)	32.82	35.12	34.67
EIRP power Limit (dBm)	36		
Margin (dB)	3.18	0.88	1.33
Measurement uncertainty (dB)	<±1.20		

**Mode: 256QAM – 20MHz**

Declared antenna gain: 6 dBi

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
Max. conducted power (dBm)	26.67	26.83	26.62
Conducted Power Limit (dBm)	30		
Margin (dB)	3.33	3.17	3.38
Maximum EIRP power (dBm)	32.67	32.83	32.62
EIRP power Limit (dBm)	36		
Margin (dB)	3.33	3.17	3.38
Measurement uncertainty (dB)	<±1.20		

## FCC Section 15.407 Subclause (a) (3) / RSS-247 Clause 6.2.4.1. Transmitter Maximum Power Spectral Density

FCC 15.407/RSS-247: The maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### RESULTS

The maximum power spectral density (PSD) was measured using the method according to point F) referencing E.2.b) (Method SA-1) of Guidance 789033 D02 General UNII Test Procedures New Rules v02r01.

**Mode: QPSK – 20MHz**

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
PSD (dBm/MHz)	12.15	14.11	14.02
PSD Limit (dBm/500KHz)	30		
Margin (dB)	17.85	15.89	15.98
Measurement uncertainty (dB)	<±1.20		

**Mode: 16QAM – 20MHz**

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
PSD (dBm/MHz)	12.95	15.06	14.86
PSD Limit (dBm/500KHz)	30		
Margin (dB)	17.05	14.94	15.14
Measurement uncertainty (dB)	<±1.20		

**Mode: 64QAM – 20MHz**

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
PSD (dBm/MHz)	12.31	14.09	13.95
PSD Limit (dBm/500KHz)	30		
Margin (dB)	17.69	15.91	16.05
Measurement uncertainty (dB)	<±1.20		

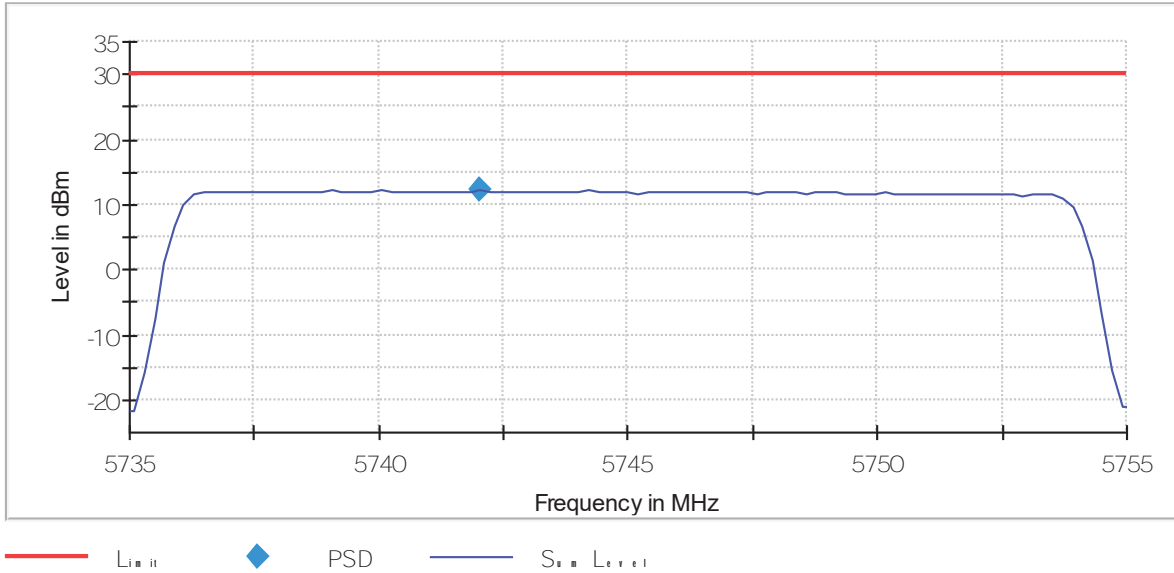
**Mode: 256QAM – 20MHz**

	Channel 149 5745 MHz	Channel 157 5785 MHz	Channel 165 5825 MHz
PSD (dBm/MHz)	12.39	12.81	11.81
PSD Limit (dBm/500KHz)	30		
Margin (dB)	17.61	17.19	18.19
Measurement uncertainty (dB)	<±1.20		

Mode: QPSK – 20 MHz

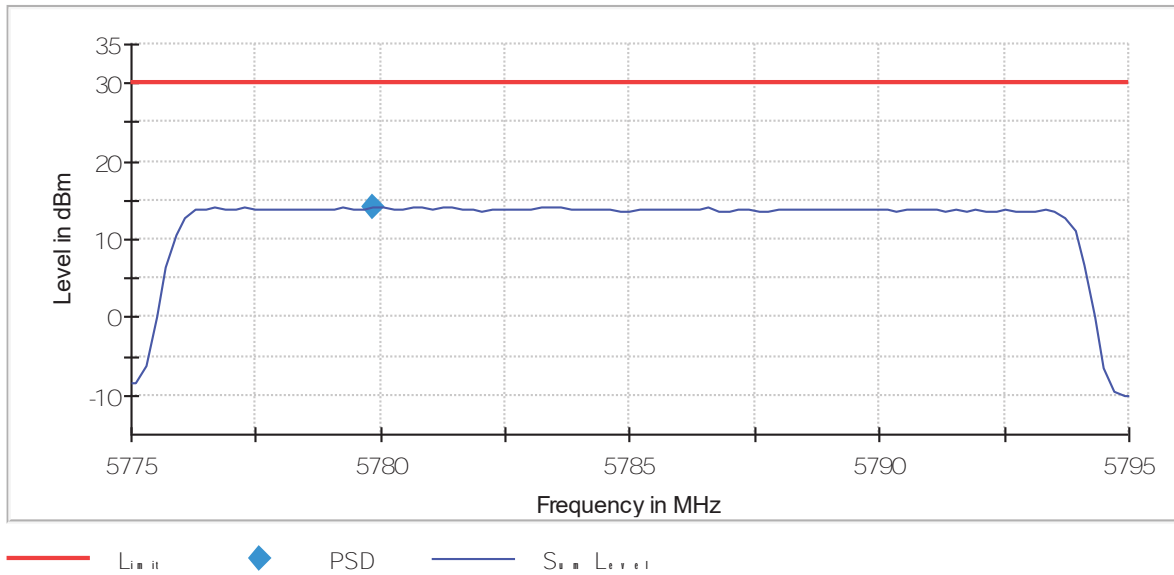
Channel 149

Power Spectral Density (SA-1)



Channel 157

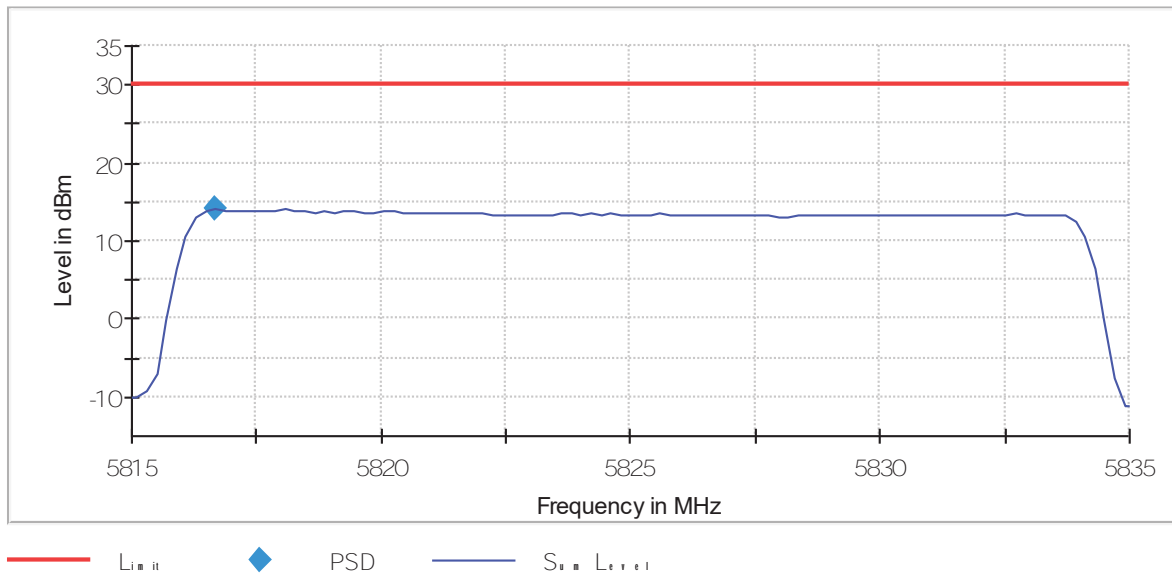
Power Spectral Density (SA-1)





Channel 165

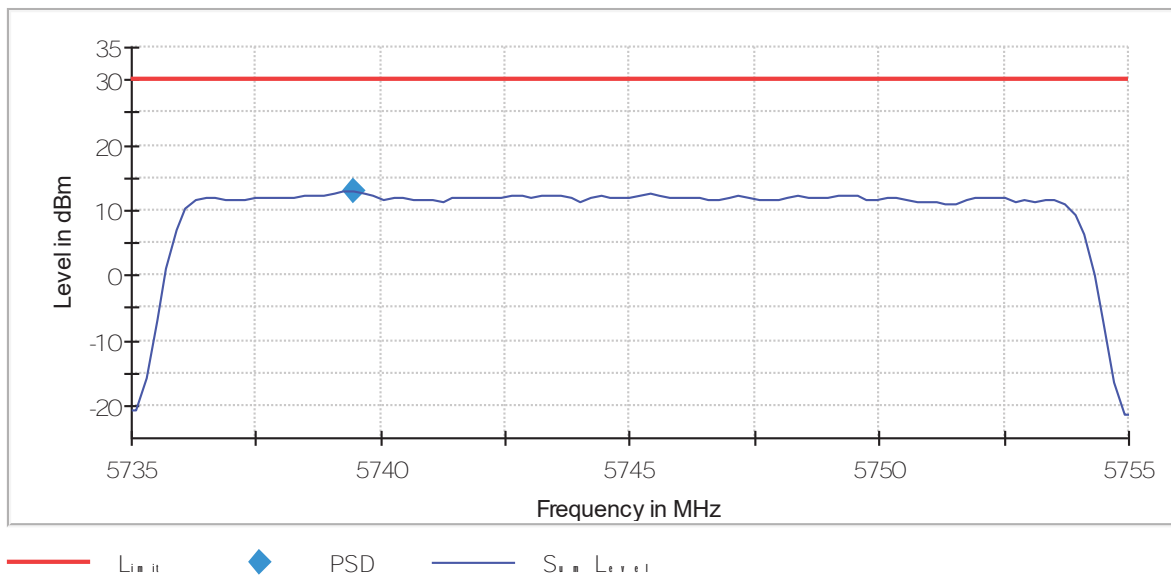
Power Spectral Density (SA-1)



Mode: 16QAM – 20MHz

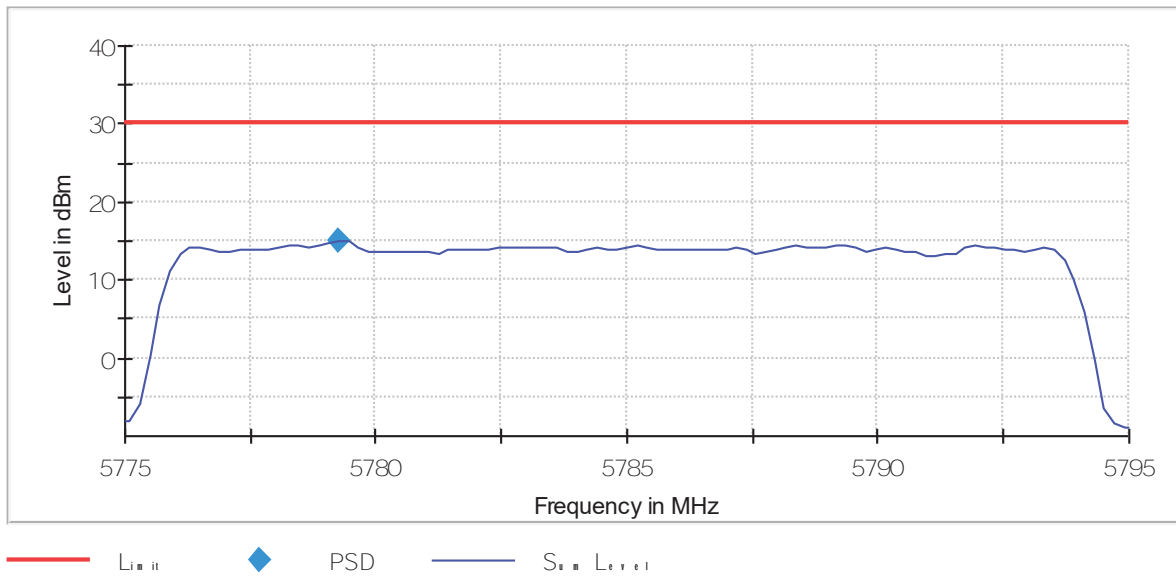
Channel 149

Power Spectral Density (SA-1)



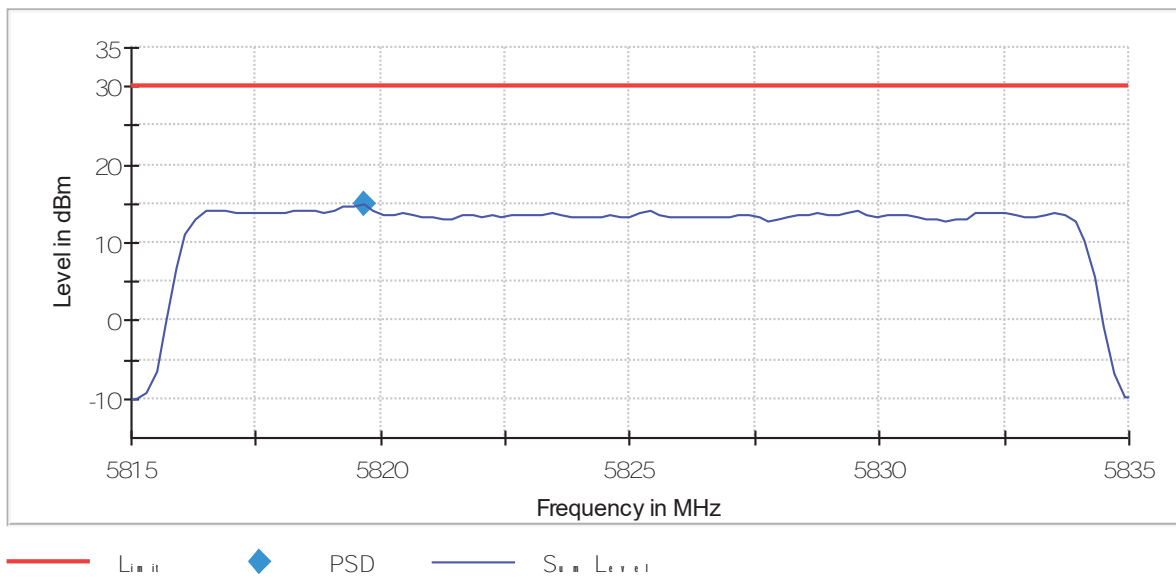
Channel 157

Power Spectral Density (SA-1)



Channel 165

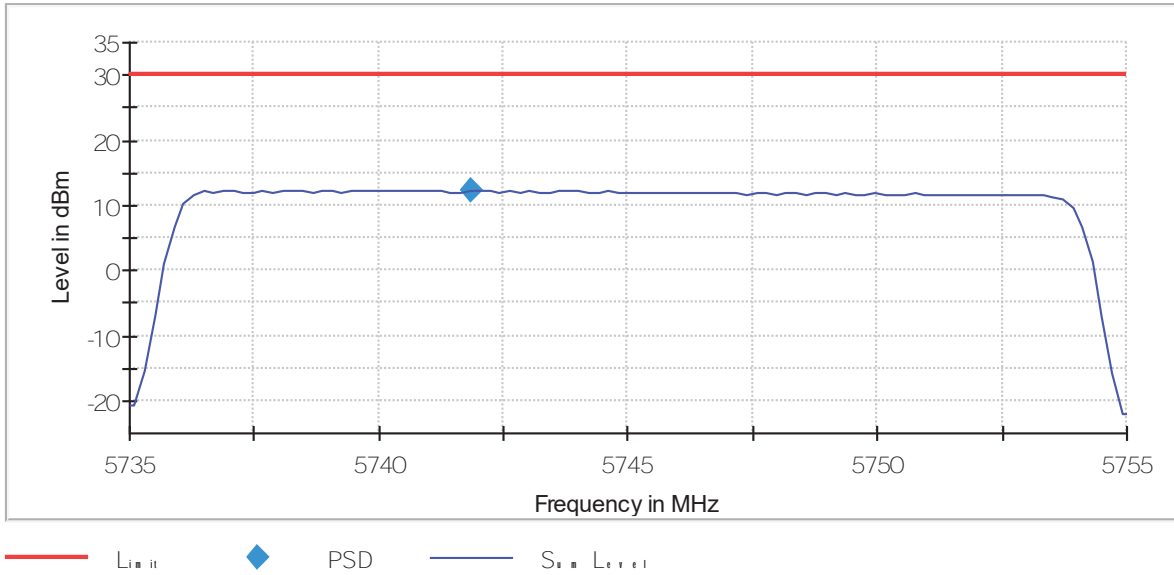
Power Spectral Density (SA-1)



Mode: 64QAM – 20MHz

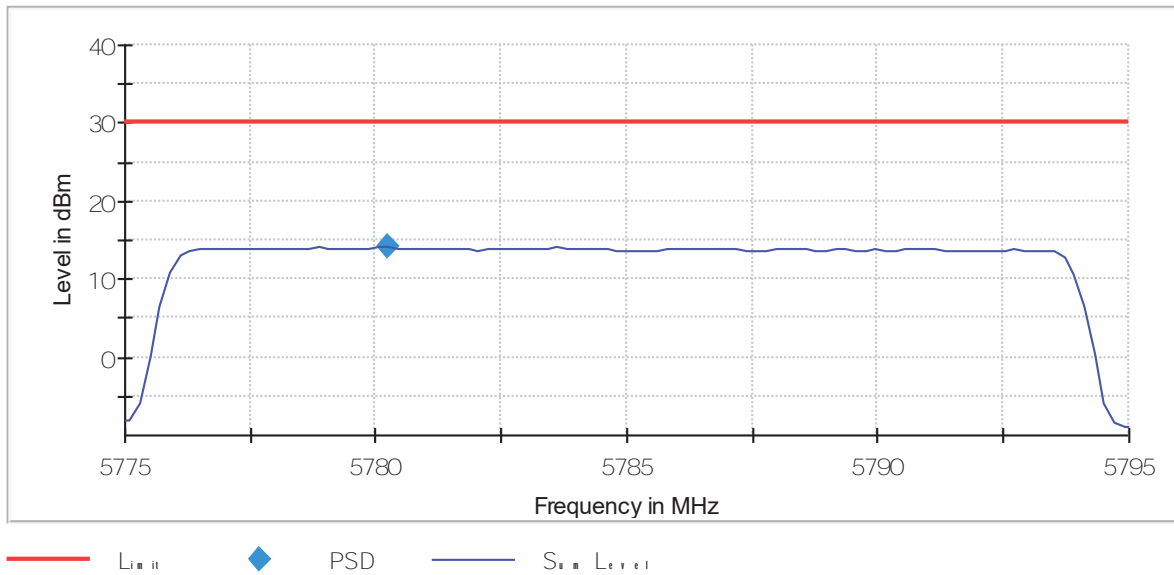
Channel 149

Power Spectral Density (SA-1)

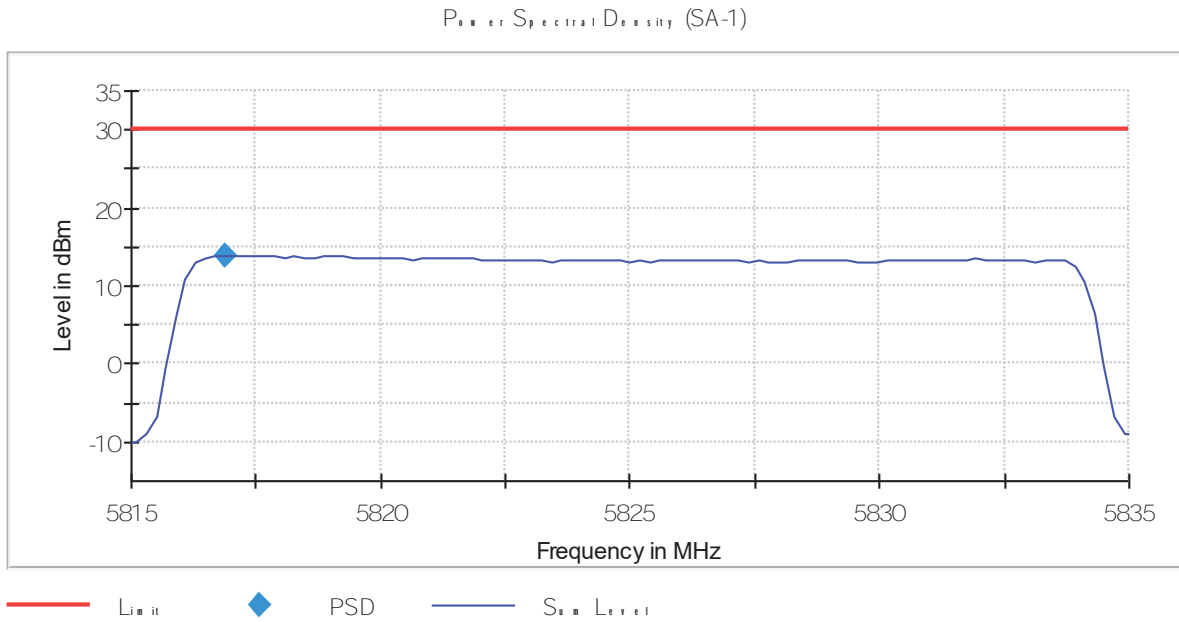


Channel 157

Power Spectral Density (SA-1)

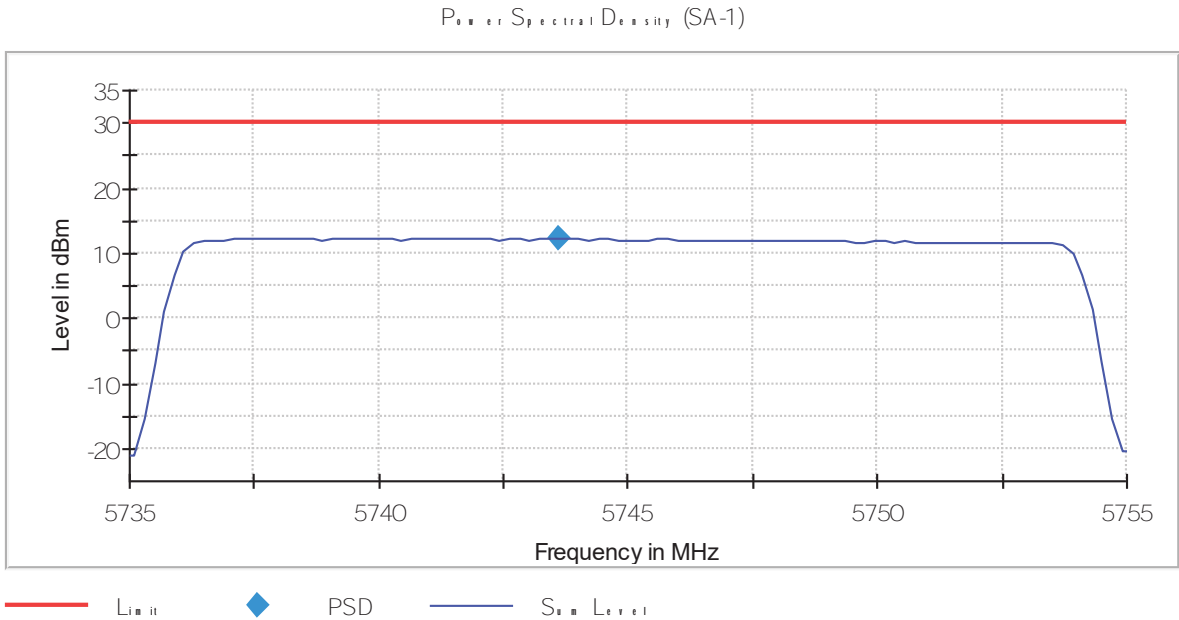


Channel 165



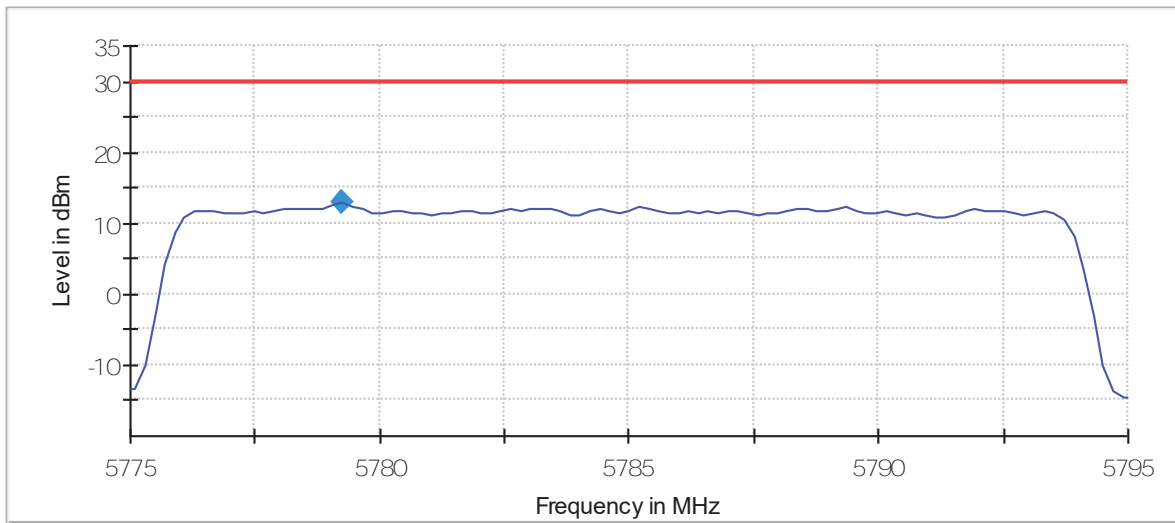
Mode: 256QAM – 20MHz

Channel 149



Channel 157

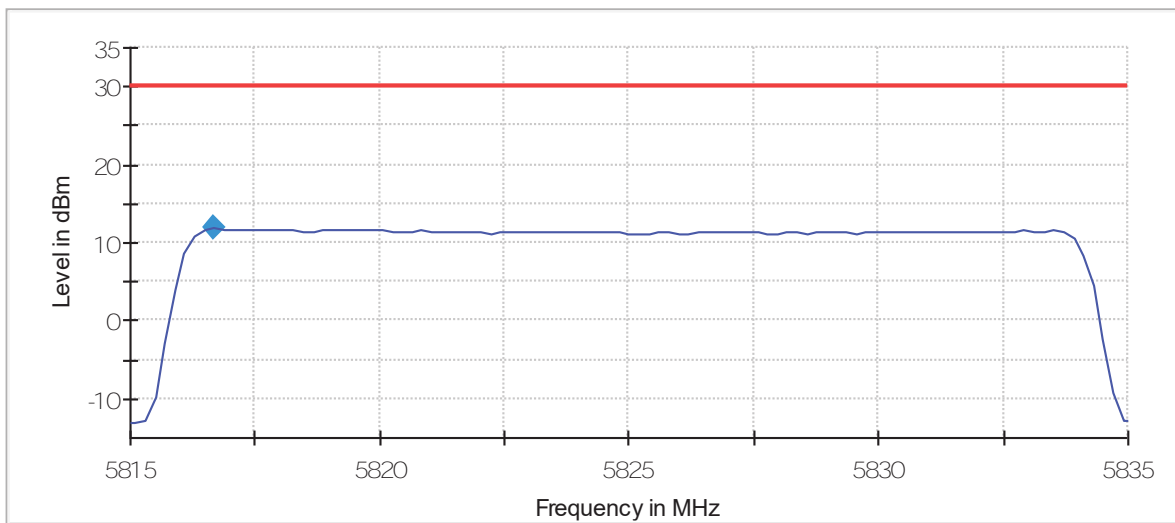
Power Spectral Density (SA-1)



— Limit    ◆ PSD    — Signal Level

Channel 165

Power Spectral Density (SA-1)



— Limit    ◆ PSD    — Signal Level

## FCC Section 15.407(b)(4)(6) /RSS-247 6.2.4.2. Transmitter Out of Band Radiated Emissions

### SPECIFICATION

For transmitters operating in the 5.725–5.85 GHz band:

All emissions shall be limited to a level of –27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

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)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 40000	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.

### RESULTS:

The situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° 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-25 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.

Test performed on the following worst case of modulation QPSK

### Frequency range 30 MHz-1000 MHz.

Note: The spurious emissions below 1 GHz do not depend on either the operating channel or the modulation mode selected in the EUT.

Spurious levels operating (radiated) closest to limit.

Spurious frequency (MHz)	Polarization	Detector	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Uncertainty (dB)
32.7160	Horizontal	Quasi-Peak	19.77	40.0	20.23	± 4.99
45.6655	Horizontal	Quasi-Peak	25.35	40.0	14.65	± 4.99
97.6575	Vertical	Quasi-Peak	22.20	43.5	21.30	± 4.99

### Frequency range 1 GHz-40 GHz

The results in the next tables show the maximum measured levels in the 1-40 GHz frequency range.

#### Mode QPSK:

##### Channel 149

Spurious signals were detected at less than 20 dB respect to the limit.

Spurious frequency (GHz)	Polarization	Detector	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Uncertainty (dB)
17.2300	Horizontal	Peak	62.67	68.23	5.56	± 5.08
22.9800	Horizontal	Peak	50.24	68.23	17.99	± 5.08

##### Channel 157

Spurious signals were detected at less than 20 dB respect to the limit.

Spurious frequency (GHz)	Polarization	Detector	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Uncertainty (dB)
17.3672	Vertical	Peak	63.12	68.23	5.11	± 5.08
19.6603	Vertical	Peak	47.42	68.23	20.81	± 5.08
		AVG	42.67	54	11.33	
23.1456	Horizontal	Peak	48.89	68.23	19.34	± 5.08
28.9132	Horizontal	Peak	52.85	68.23	15.38	± 5.33

**Channel 165**

Spurious signals were detected at less than 20 dB respect to the limit.

Spurious frequency (GHz)	Polarization	Detector	Emission Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Measurement Uncertainty (dB)
17.4738	Vertical	Peak	60.85	68.23	7.38	± 5.08
23.2997	Horizontal	Peak	50.89	68.23	17.34	± 5.08
29.1302	Vertical	Peak	53.05	68.23	15.18	± 5.33

Measurement Uncertainty (dB): 1GHz to 17GHz <± 4.98

17GHz to 26.5GHz <± 5.08

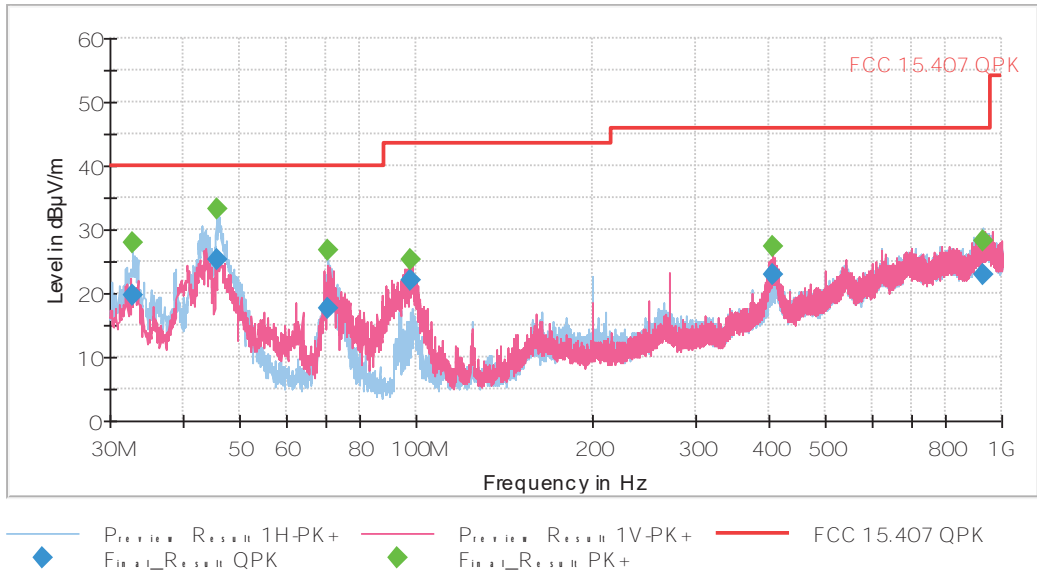
26.5GHz to 40GHz <± 5.33

Verdict: PASS



### FREQUENCY RANGE 30 MHz-1000 MHz.

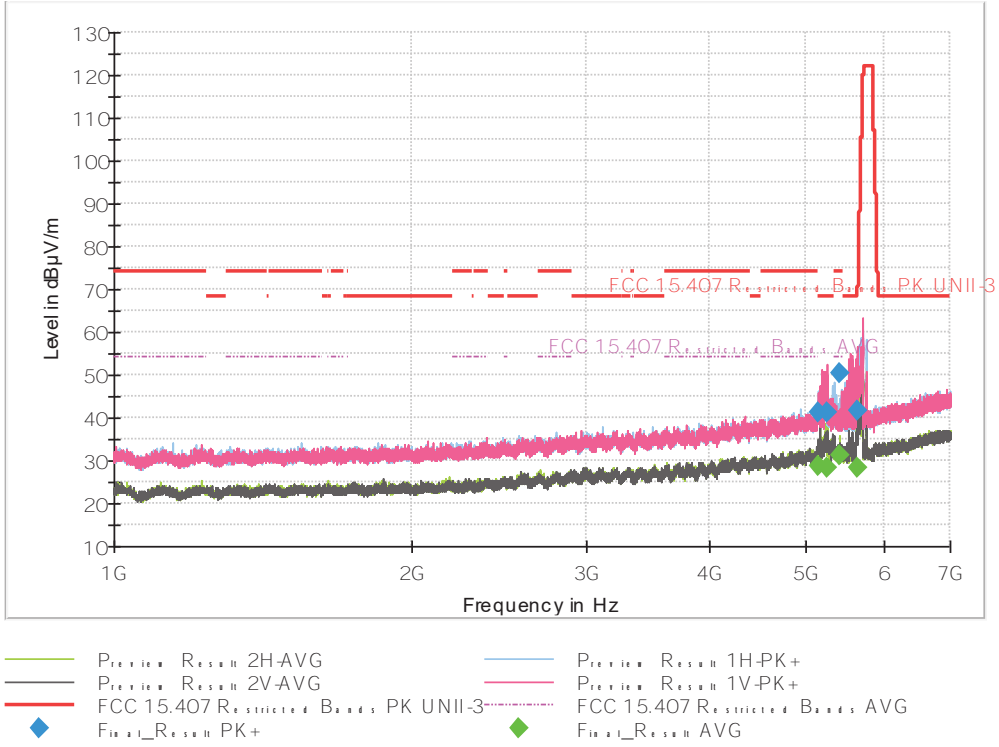
This plot is valid for all channels.



**FREQUENCY RANGE 1 GHz to 7 GHz.**

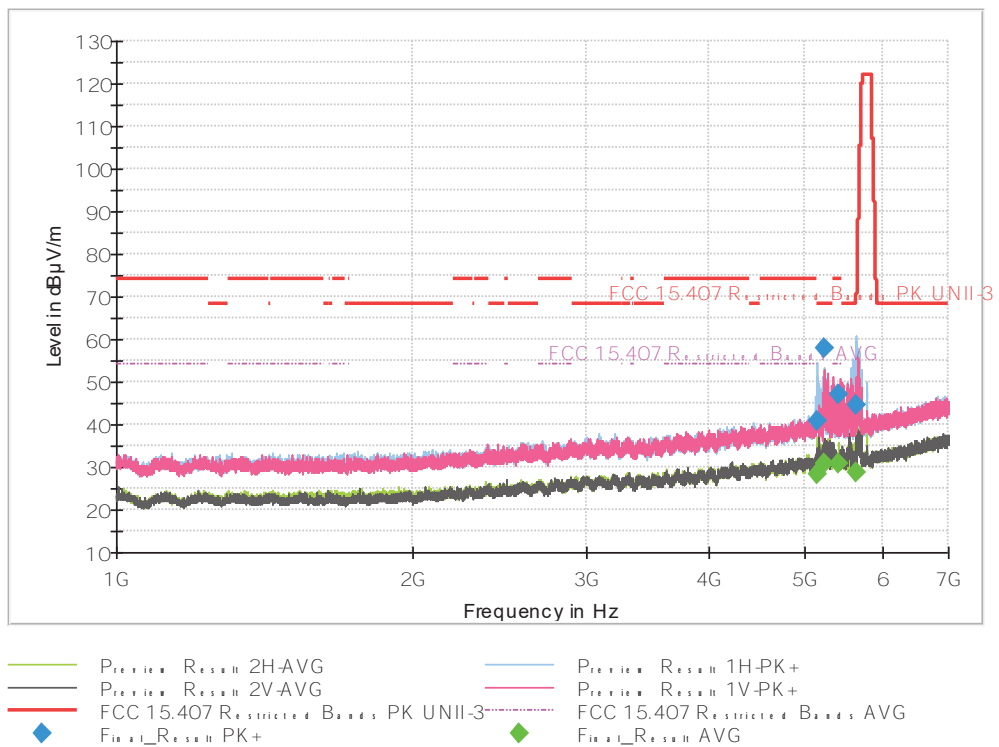
**Mode QPSK:**

**Channel 149**



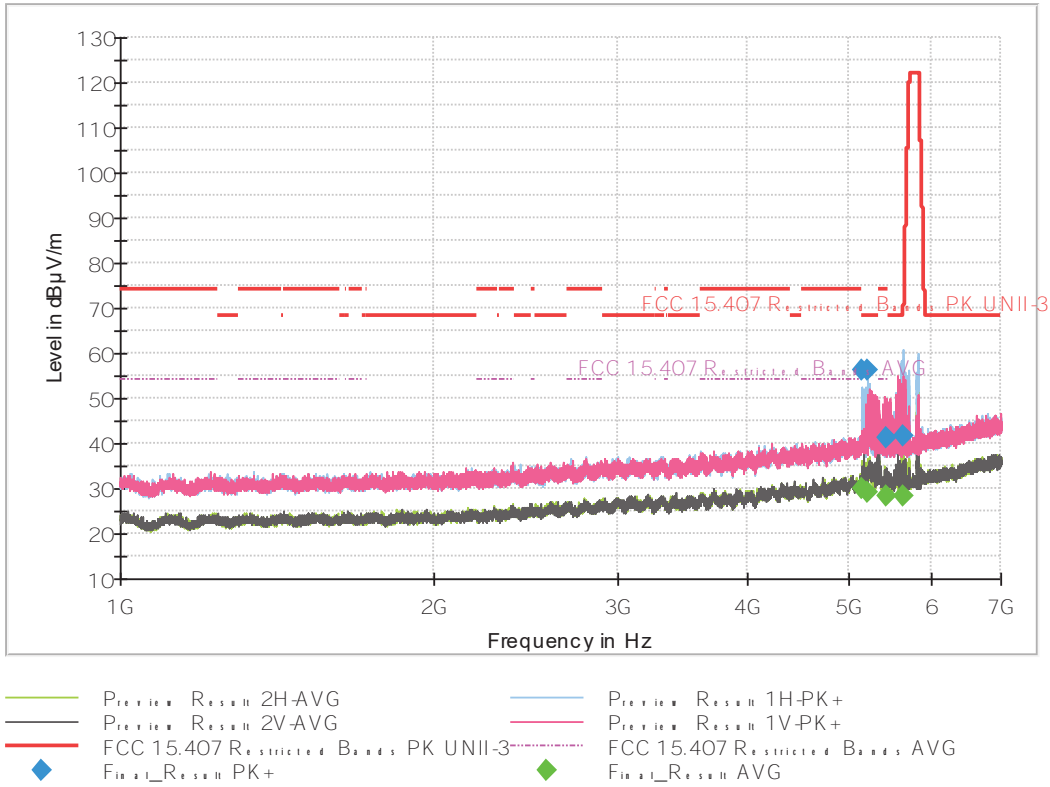
Note: The peak shown in the plot above the limit is the carrier frequency.

**Channel 157**



Note: The peak shown in the plot above the limit is the carrier frequency.

Channel 165

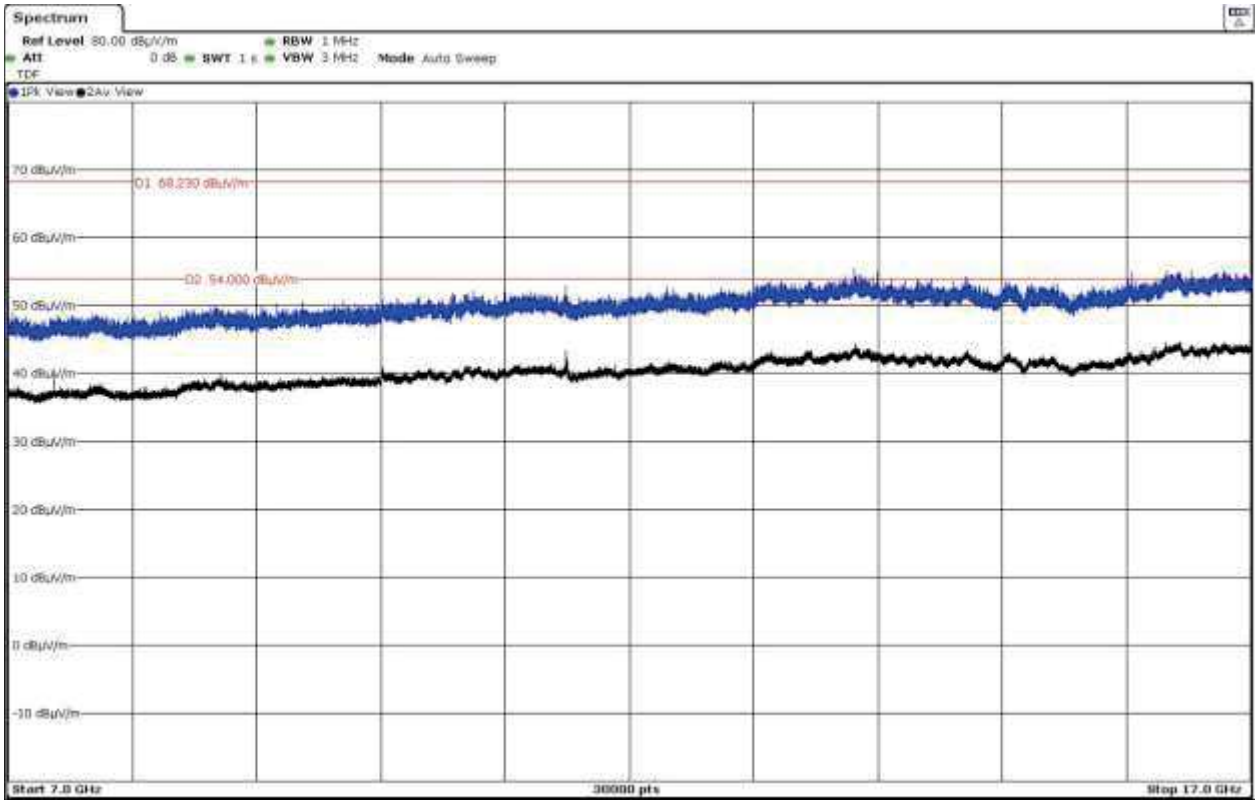


Note: The peak shown in the plot above the limit is the carrier frequency.

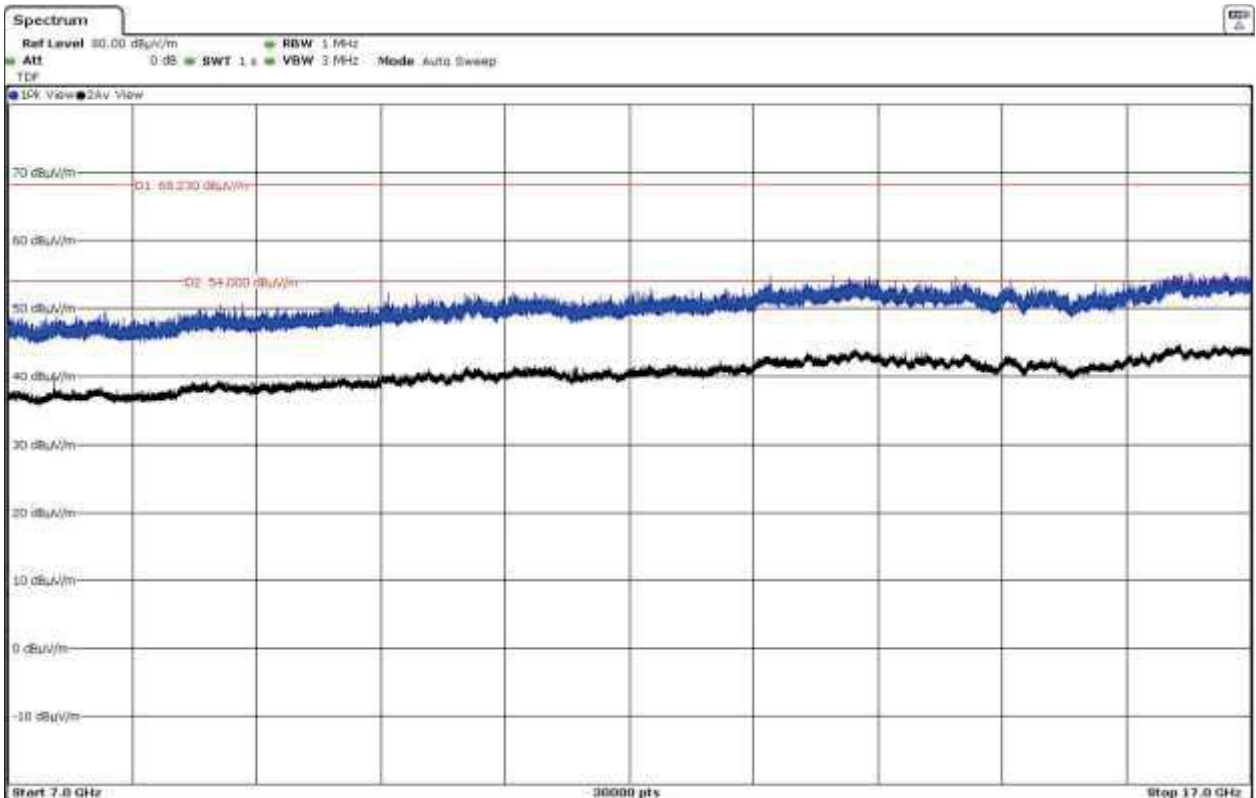
**FREQUENCY RANGE 7 GHz to 17 GHz.**

**Mode QPSK:**

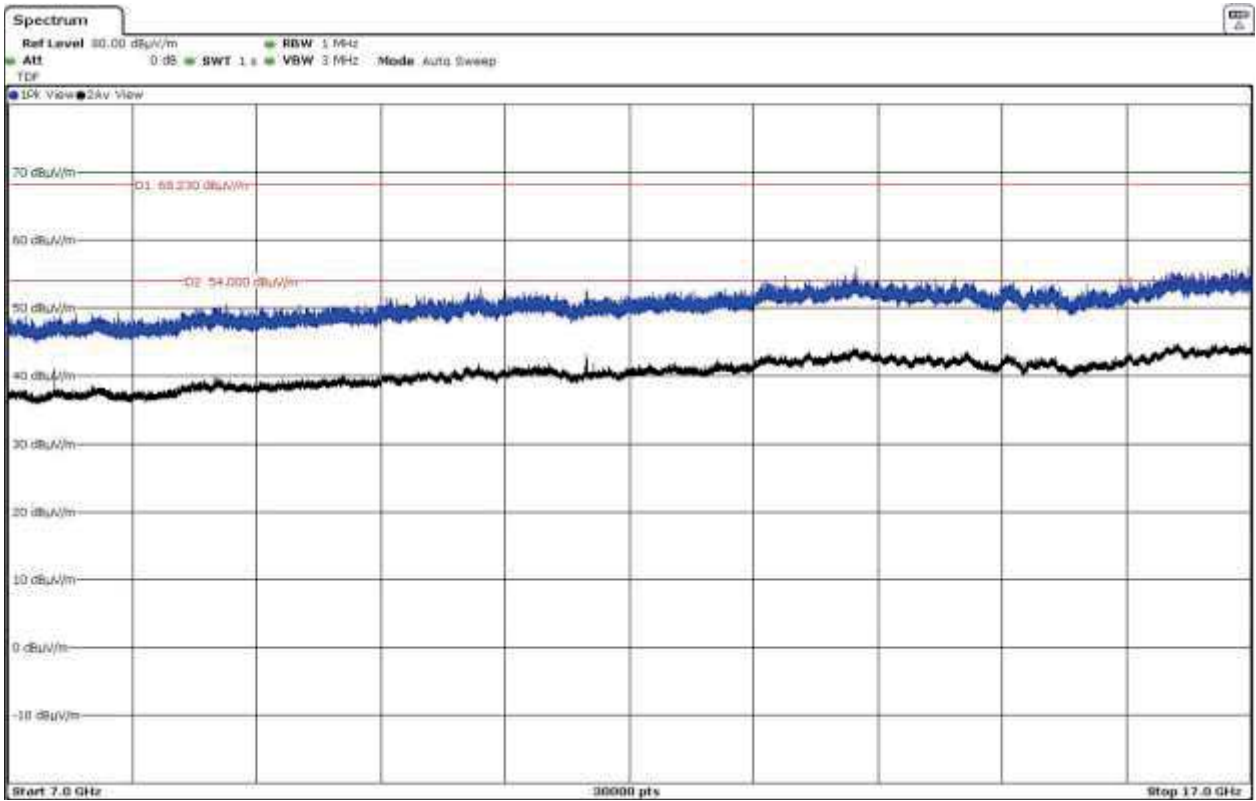
**Channel 149**



**Channel 157**



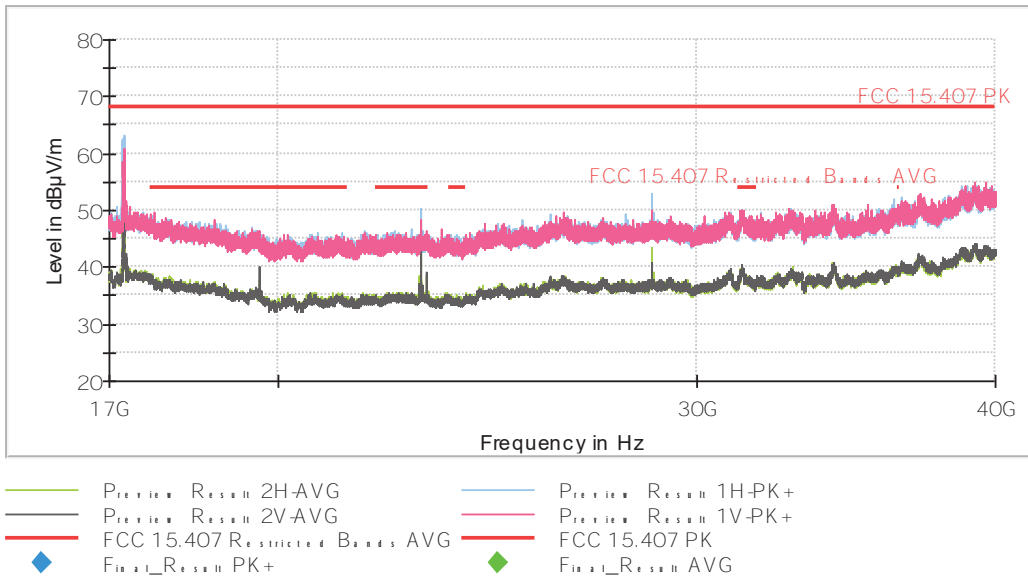
Channel 165



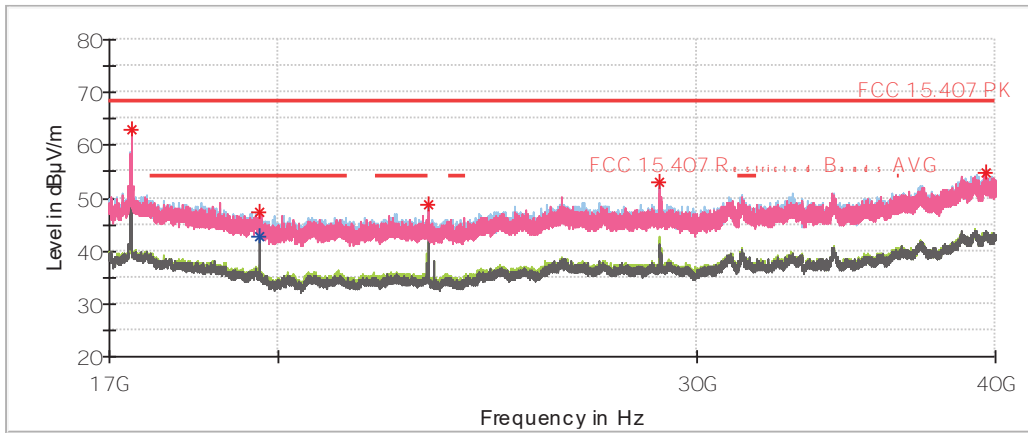
FREQUENCY RANGE 17 GHz to 40 GHz.

Mode QPSK:

Channel 149

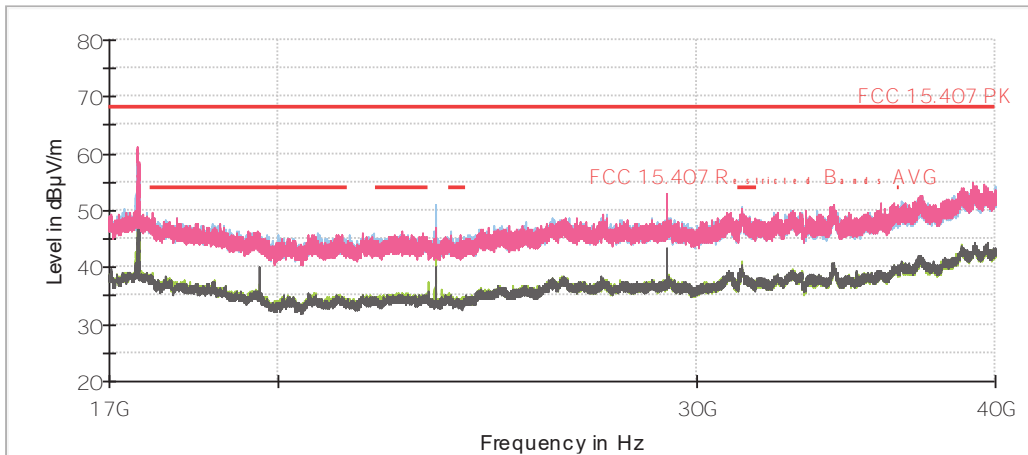


**Channel 157**



- |                       |                                 |
|-----------------------|---------------------------------|
| Preview Result 2H-AVG | Preview Result 1H-PK+           |
| Preview Result 2V-AVG | Preview Result 1V-PK+           |
| Critical Freqs AVG    | Critical Freqs PK+              |
| FCC 15.407 PK         | FCC 15.407 Restricted Bands AVG |
| Final Result PK+      | Final Result AVG                |

**Channel 165**



- |                                 |                       |
|---------------------------------|-----------------------|
| Preview Result 2H-AVG           | Preview Result 1H-PK+ |
| Preview Result 2V-AVG           | Preview Result 1V-PK+ |
| FCC 15.407 Restricted Bands AVG | FCC 15.407 PK         |
| Final Result PK+                | Final Result AVG      |

## FCC Section 15.407 Subclause (b) (4) / RSS-247 6.2.4.2. Transmitter Band Edge Radiated Emissions.

### SPECIFICATION

For transmitters operating in the 5.725–5.85 GHz band:

All emissions shall be limited to a level of  $-27$  dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

Frequency Range (MHz)	Field strength ( $\mu$ V/m)	Field strength (dB $\mu$ V/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	300
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 40000	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.

### RESULTS:

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.

**Results for Mode: QPSK – 20 MHz**

**Results: Peak / Channel 149**

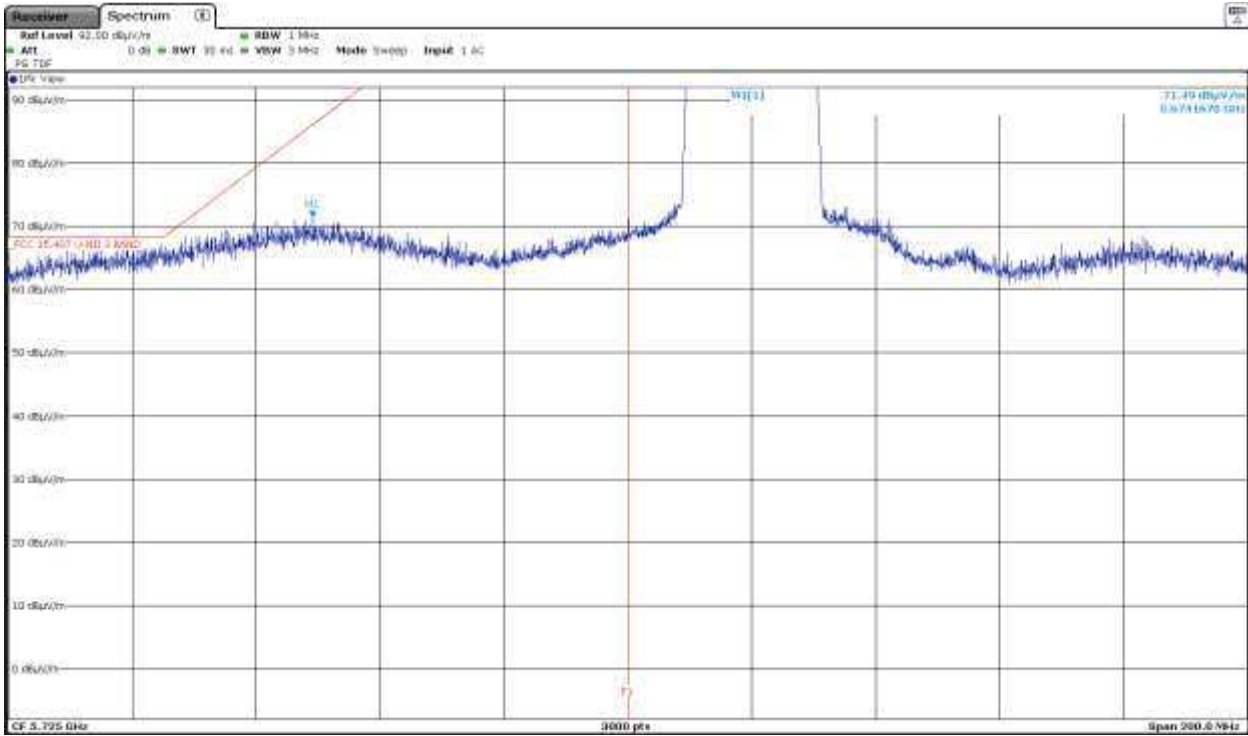
Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5674.1670	Horizontal	71.49	<± 3.98	PASS

**Results: Peak / Channel 165**

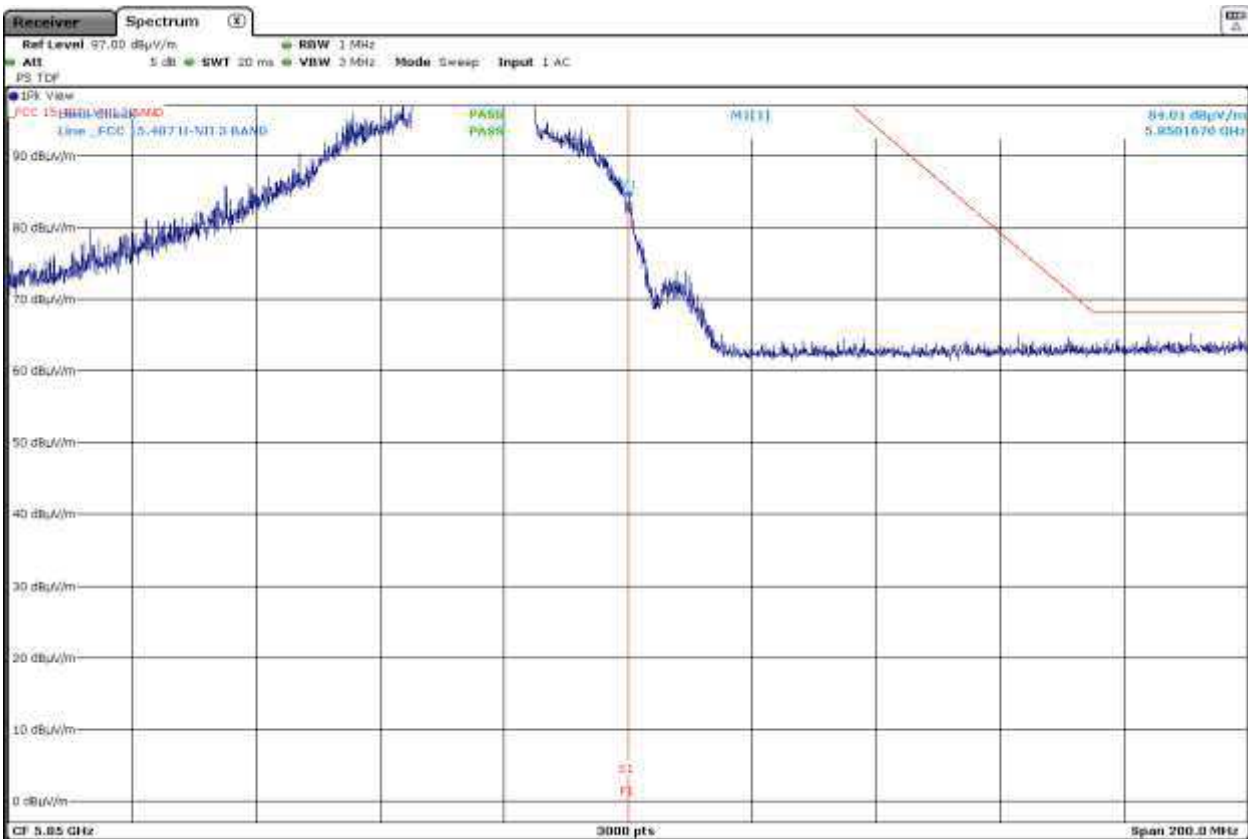
Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5850.1670	Vertical	84.01	<± 3.98	PASS



### Lower Band Edge Channel 149



### Upper Band Edge Channel 165



**Results for Mode: 16QAM – 20 MHz**

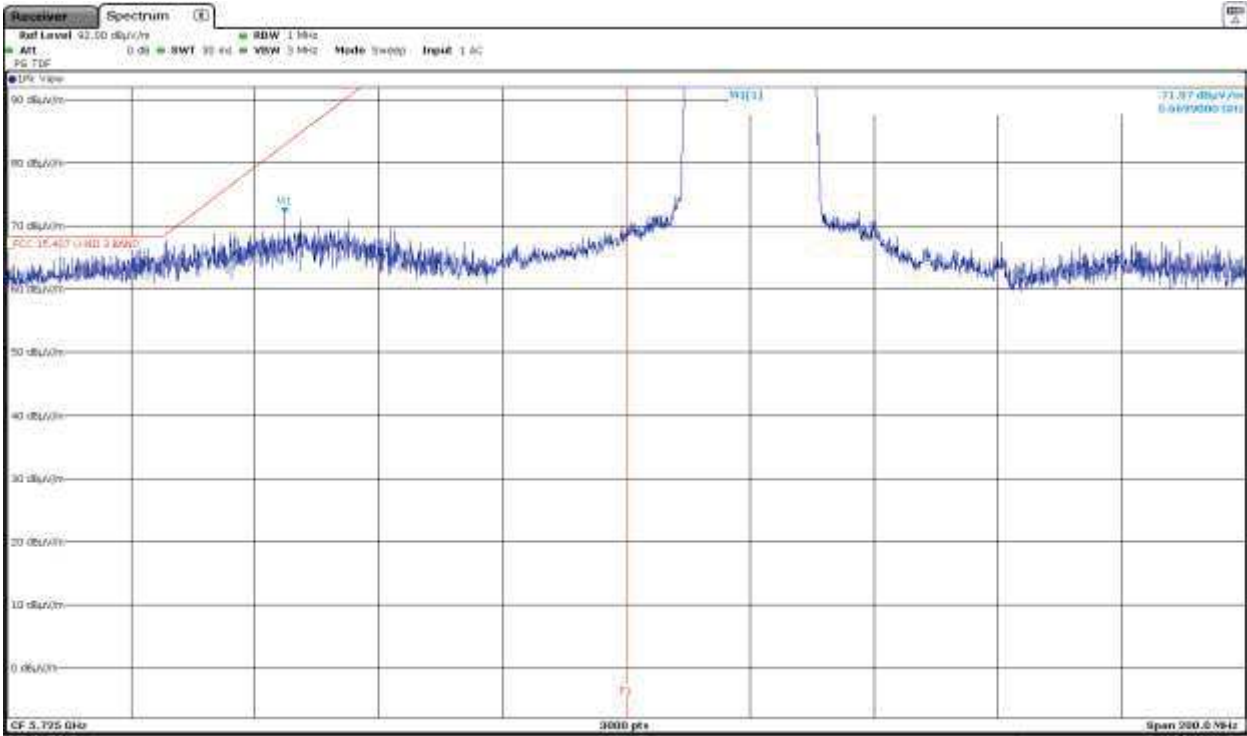
**Results: Peak / Channel 149**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5669.9000	Horizontal	71.97	<± 3.98	PASS

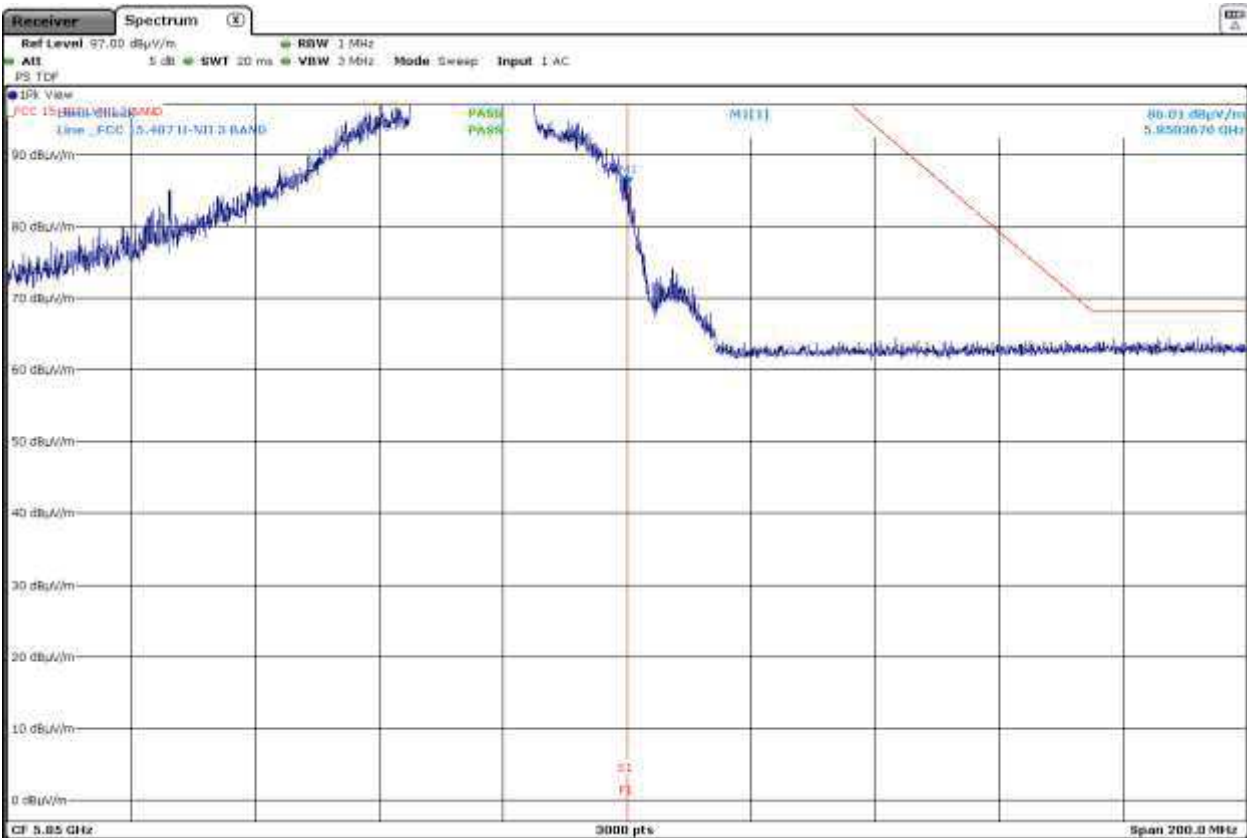
**Results: Peak / Channel 165**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5850.3670	Vertical	86.01	<± 3.98	PASS

### Lower Band Edge Channel 149



### Upper Band Edge Channel 165



**Results for Mode: 64QAM – 20 MHz**

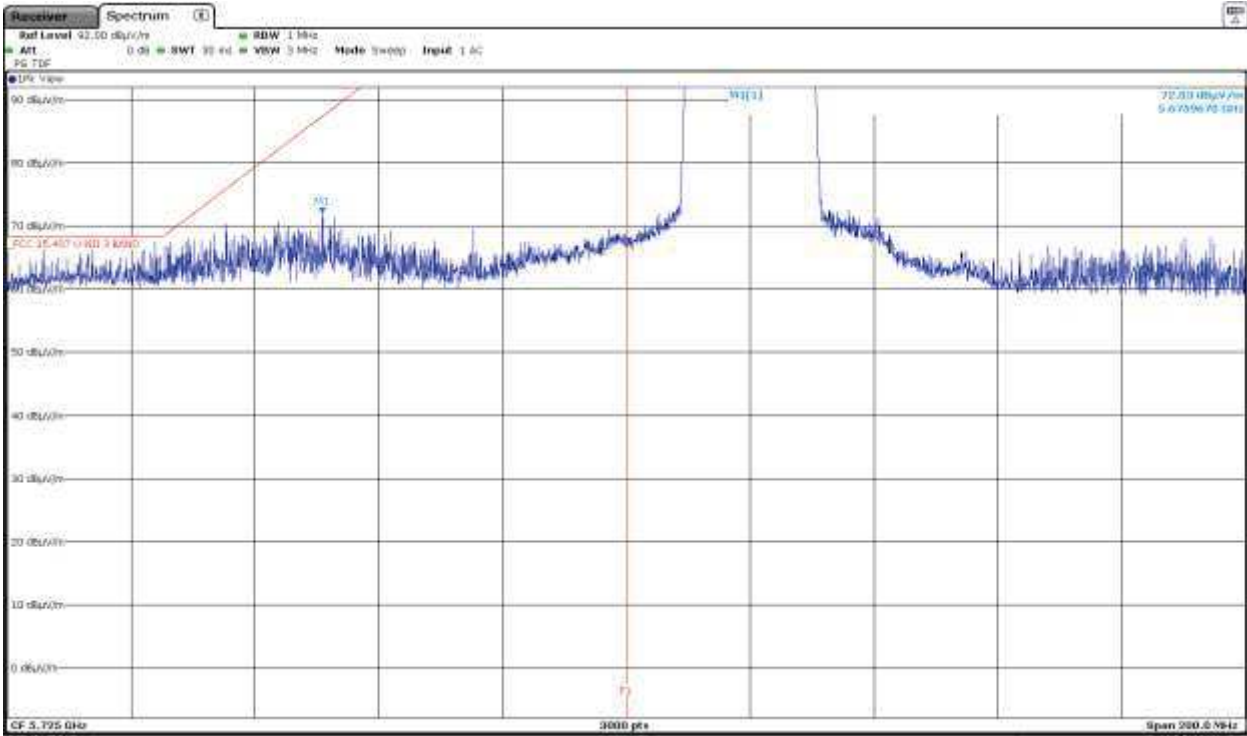
**Results: Peak / Channel 149**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5675.9670	Horizontal	72.03	<± 3.98	PASS

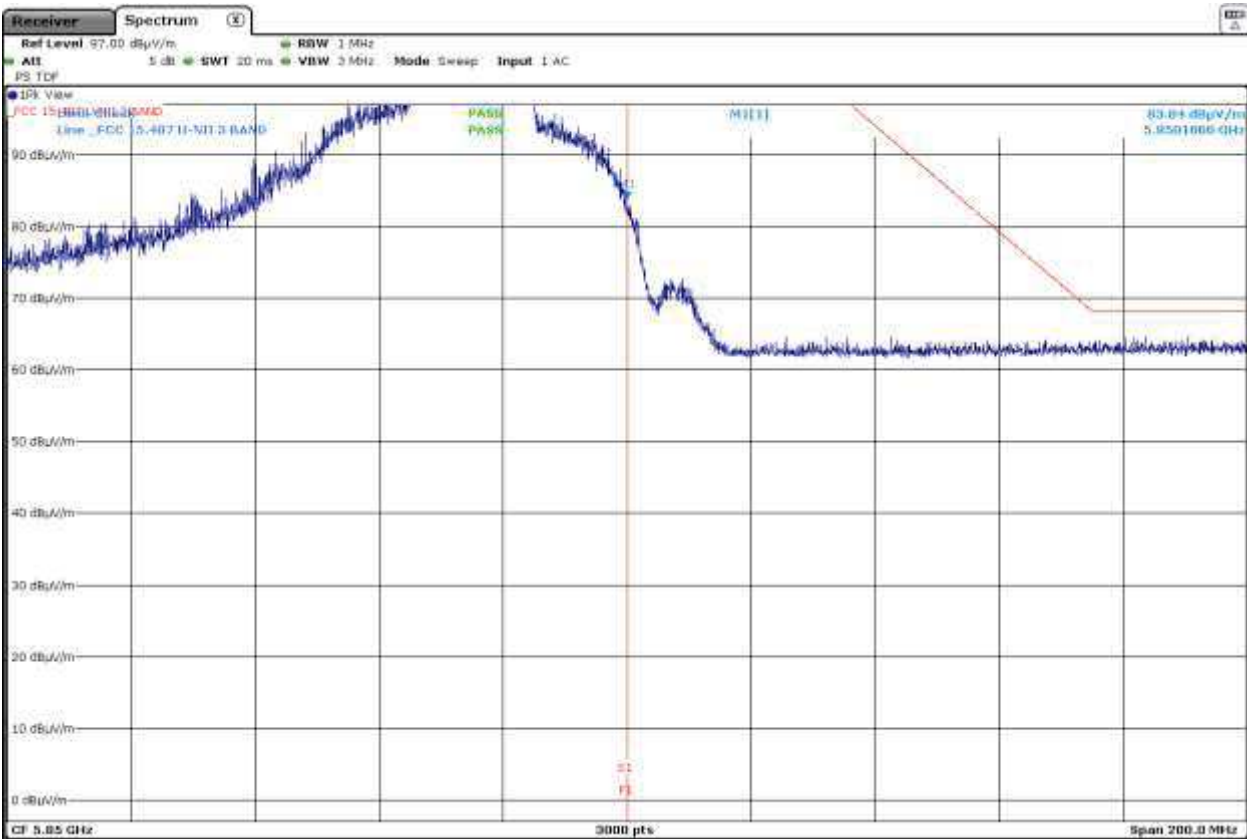
**Results: Peak / Channel 165**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5850.1000	Vertical	83.84	<± 3.98	PASS

### Lower Band Edge Channel 149



### Upper Band Edge Channel 165



**Results for Mode: 256QAM – 20 MHz**

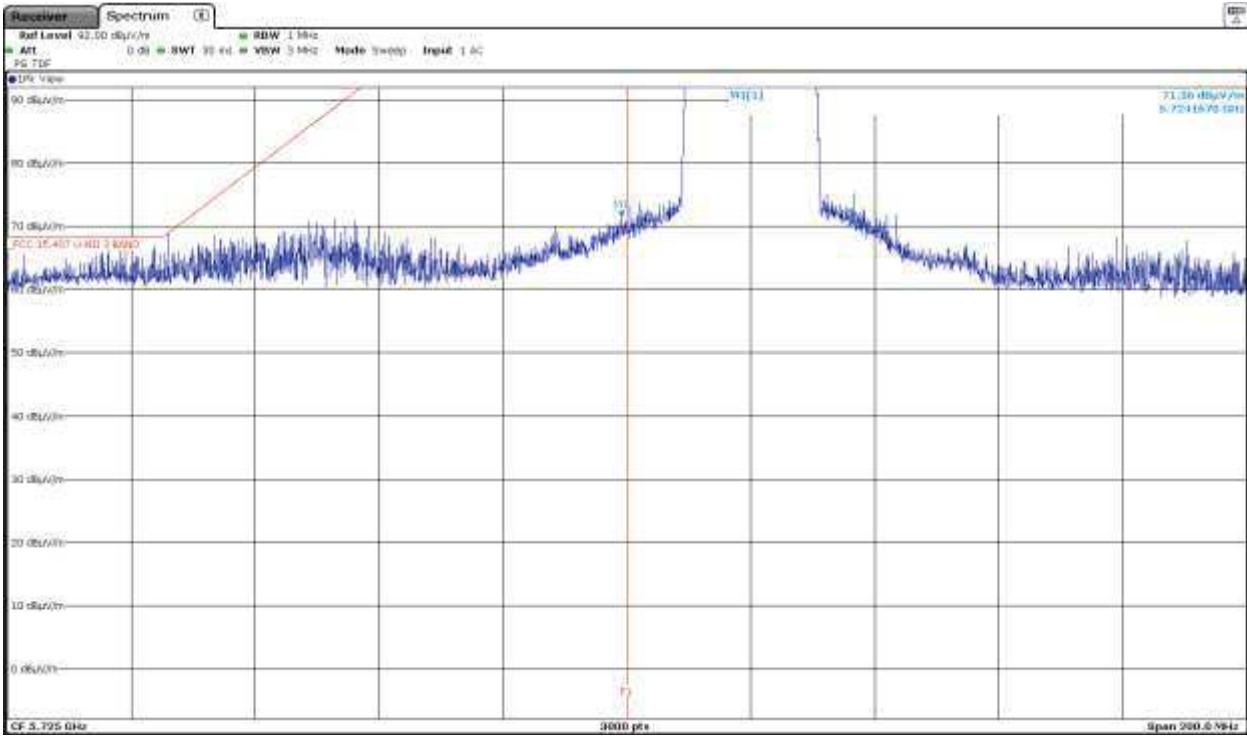
**Results: Peak / Channel 149**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5724.1670	Horizontal	71.56	<± 3.98	PASS

**Results: Peak / Channel 165**

Frequency (MHz)	Antenna Polarity	Peak Level (dBuV/m)	Measurement uncertainty (dB)	Verdict
5850.3000	Vertical	83.68	<± 3.98	PASS

### Lower Band Edge Channel 149



### Upper Band Edge Channel 165

