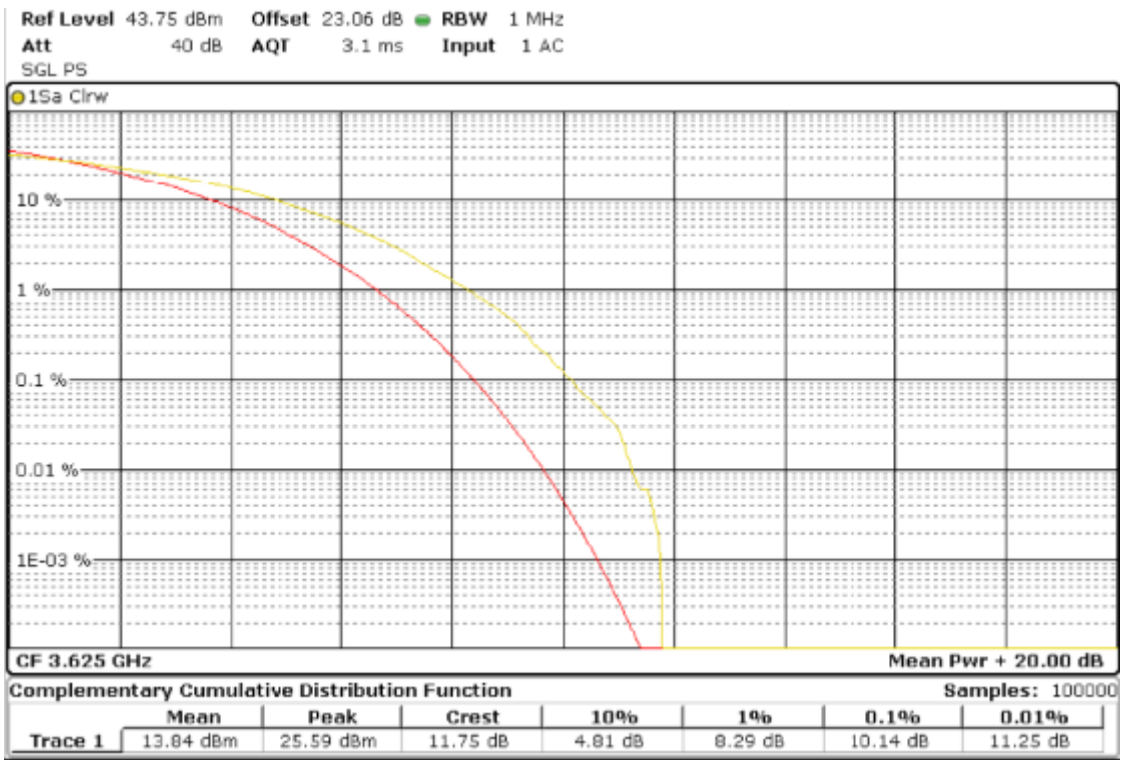


Port 3

Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)

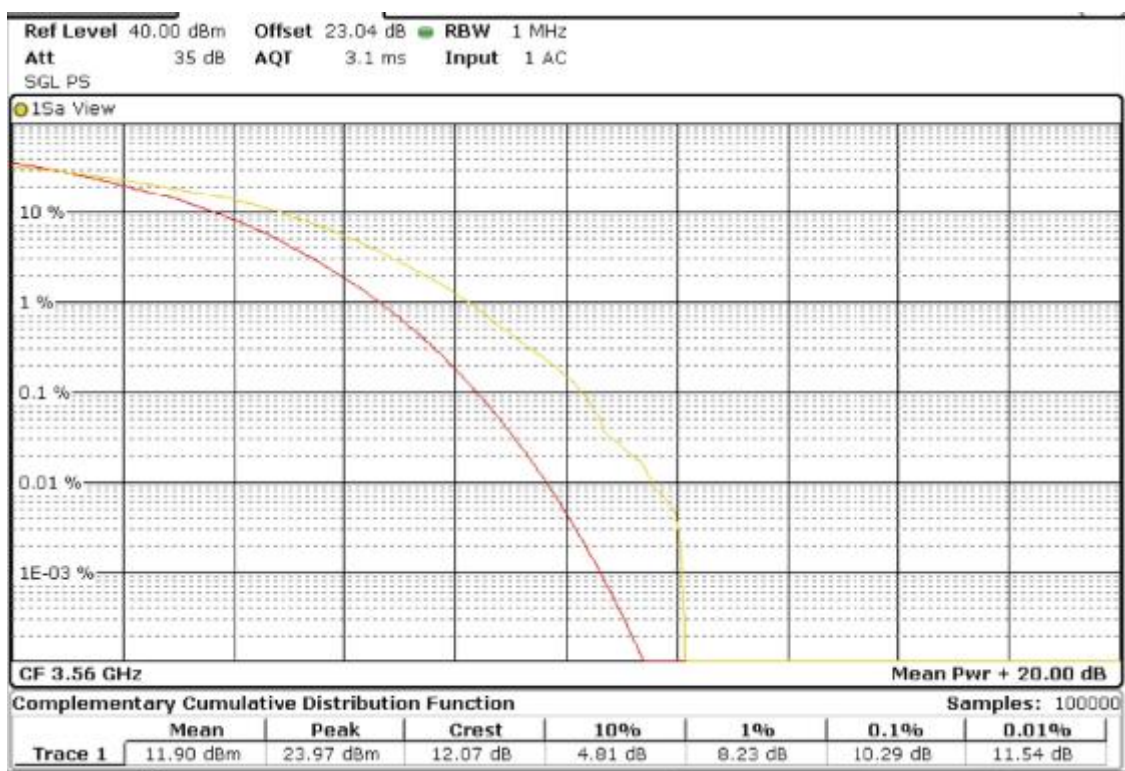


Highest Channel (3690 MHz)

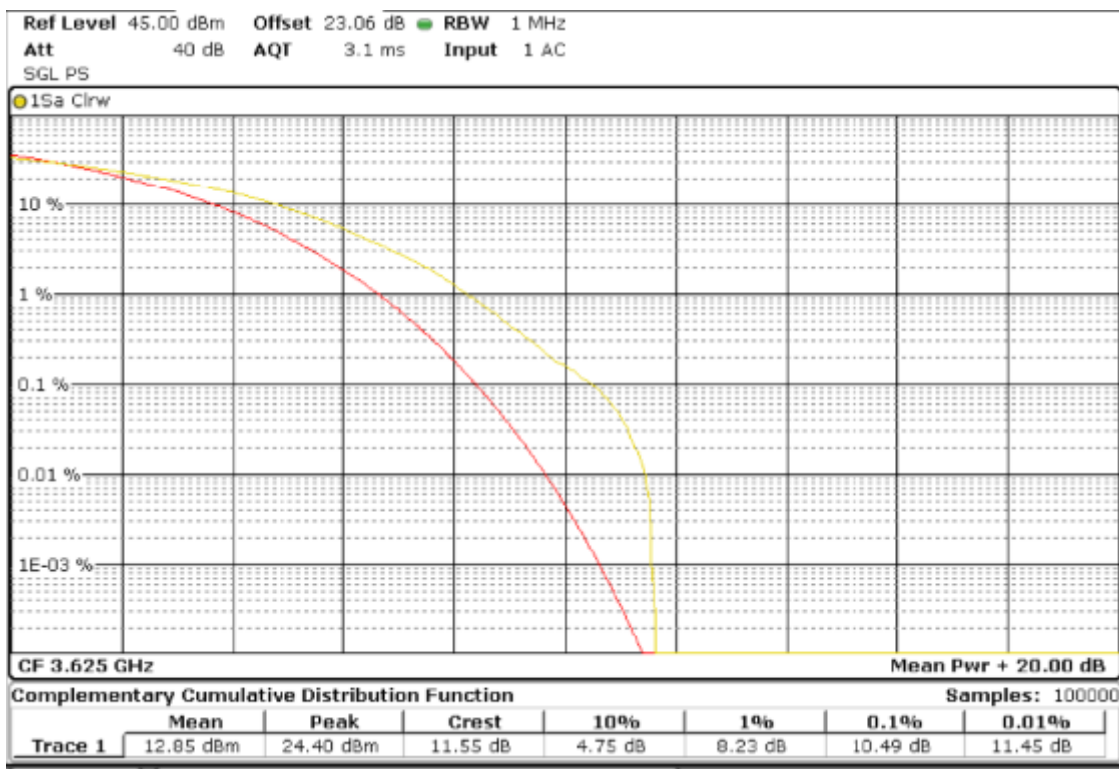


Port 4

Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)



Highest Channel (3690 MHz)



Section 2.1051 and 96.41 Subclause (e). 3.5 GHz Emissions and Interference Limits

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

Confirm that the device satisfies the emission limits specified in Section 96.41(e) for all declared channel sizes, at the lowest and highest edges of the band, and in the middle of the band. The RMS detector was used for the measurement at each frequency with 400 MHz span.

A narrower RBW is permitted in all cases to improve measurement accuracy, provided the measured power is integrated over the full reference bandwidth.

The limits for emission outside the fundamental are stated below.

- within 0-10 MHz above and below the assigned channel ≤ -13 dBm/MHz
- greater than 10 MHz above and below the assigned channel ≤ -25 dBm/MHz
- any emission below 3530 MHz and above 3720 MHz ≤ -40 dBm/MHz

The following 10 log (1/duty cycle) was added in RF level offset to get the accurate measured power level in the average power measurement.

The duty cycle correction = $10 \log (1/0.74) = 1.31$ (dB)

The measured values from the two ports were summed by using the measure-and-sum technique in E) 1) of KDB 662911 D01 Multiple Transmitter Output v02r01 and based on two ports, port 1 and 3 (or port 2 and 4) transmitting at the same time in the 2X2 MIMO mode.

RESULTS

2x2 MIMO

10MHz BW

Port 1 and 3

Lowest 3555 MHz		Middle 3625 MHz		Highest 3695 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3455.78	-45.49	3440.62	-44.96	3502.54	-45.01
3501.50	-44.73	3501.74	-44.36	3731.98	-44.75
3732.68	-44.24	3502.34	-44.74		
		3501.74/3502.34	-41.54 (*)		
		3732.06	-44.46		
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Port 2 and 4

Lowest 3555 MHz		Middle 3625 MHz		Highest 3695 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
No Spurious		No Spurious		No Spurious	
Measurement uncertainty (dB)				<± 2.03	

20MHz BW

Port 1 and 3

Lowest 3560 MHz		Middle 3625 MHz		Highest 3690 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3378.96	-44.21	3471.52	-44.92	3501.94	-45.03
3440.34	-44.15	3502.00	-44.61	3501.94	-44.26
3471.64	-43.54	3778.56	-45.76	3501.94/3501.94	-41.62(*)
3748.48	-45.65	3778.66	-45.13	3778.04	-44.65
		3778.56/3778.66	-42.42 (*)	3778.86	-45.16
				3778.04/3778.86	-41.89 (*)
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Port 2 and 4

Lowest 3560 MHz		Middle 3625 MHz		Highest 3690 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3440.34	-44.56	3440.22	-41.96	3501.94	-45.25
3440.34	-42.58	3440.44	-44.87	3748.26	-45.37
3440.34/3440.34	-40.45(*)	3440.22/3440.44	-40.17 (*)		
3748.48	-46.15	3501.70	-45.14		
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Verdict: PASS

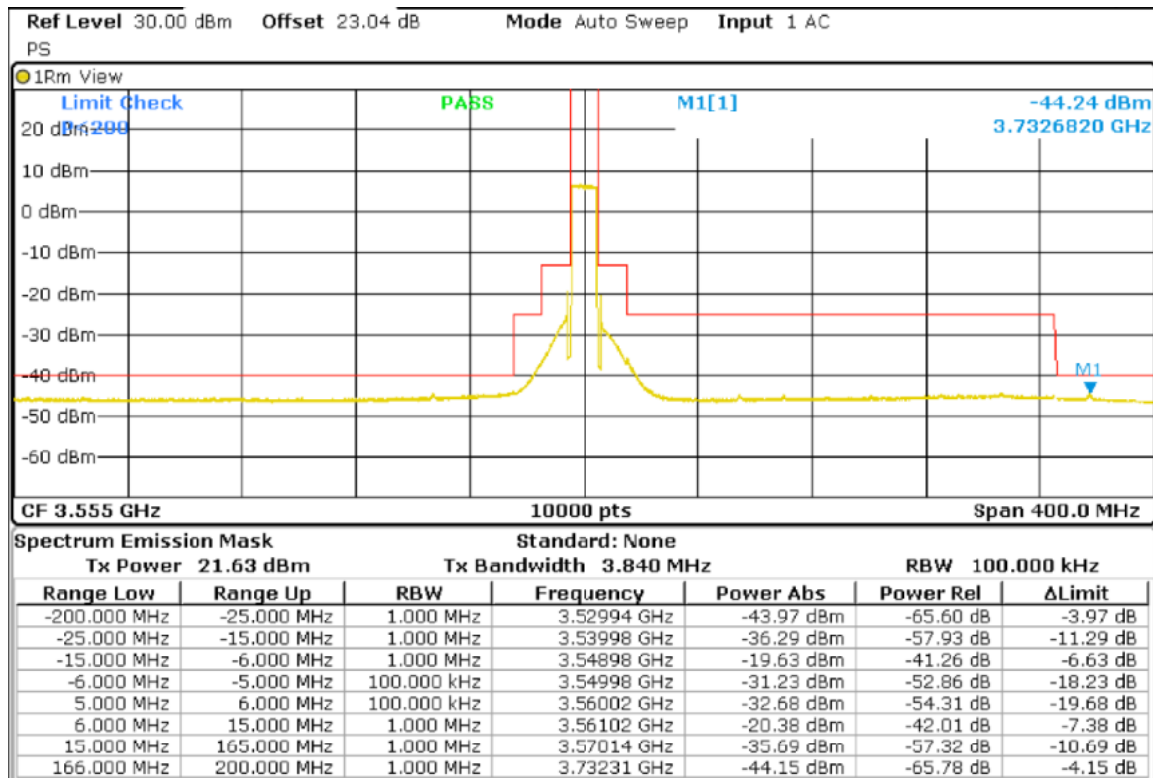
(See next plots)

2X2 MIMO mode

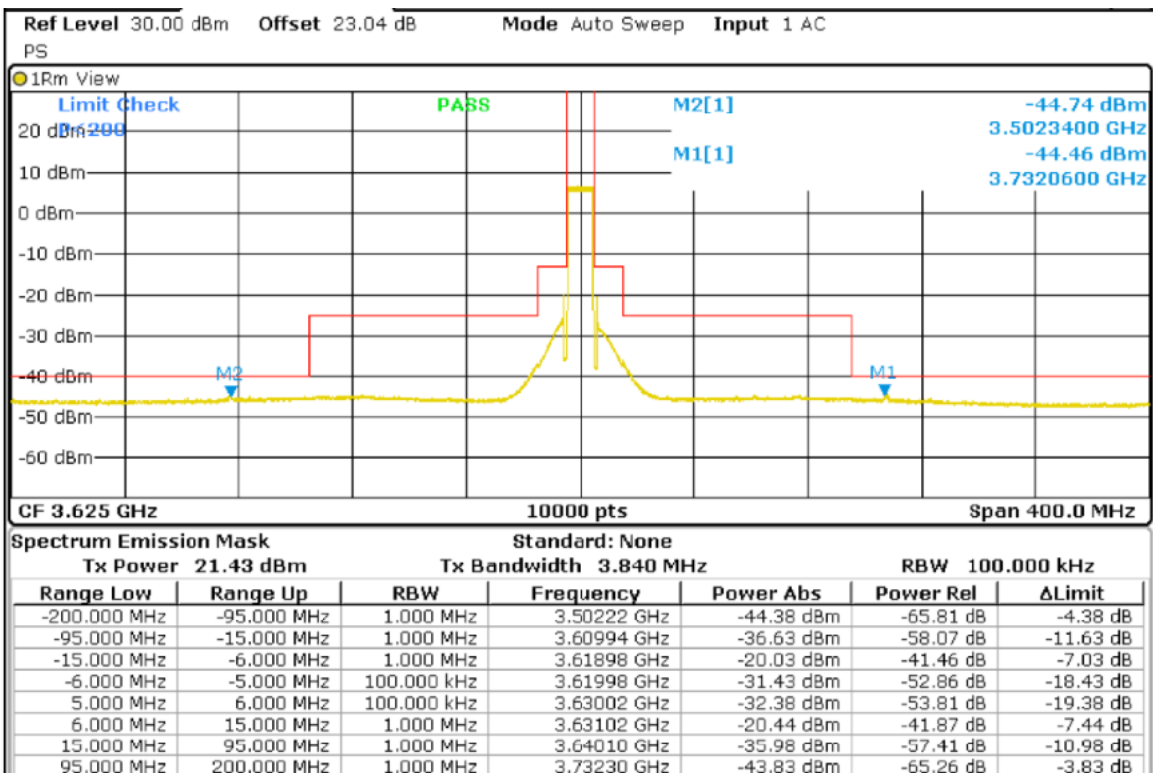
10MHz BW

Port 1

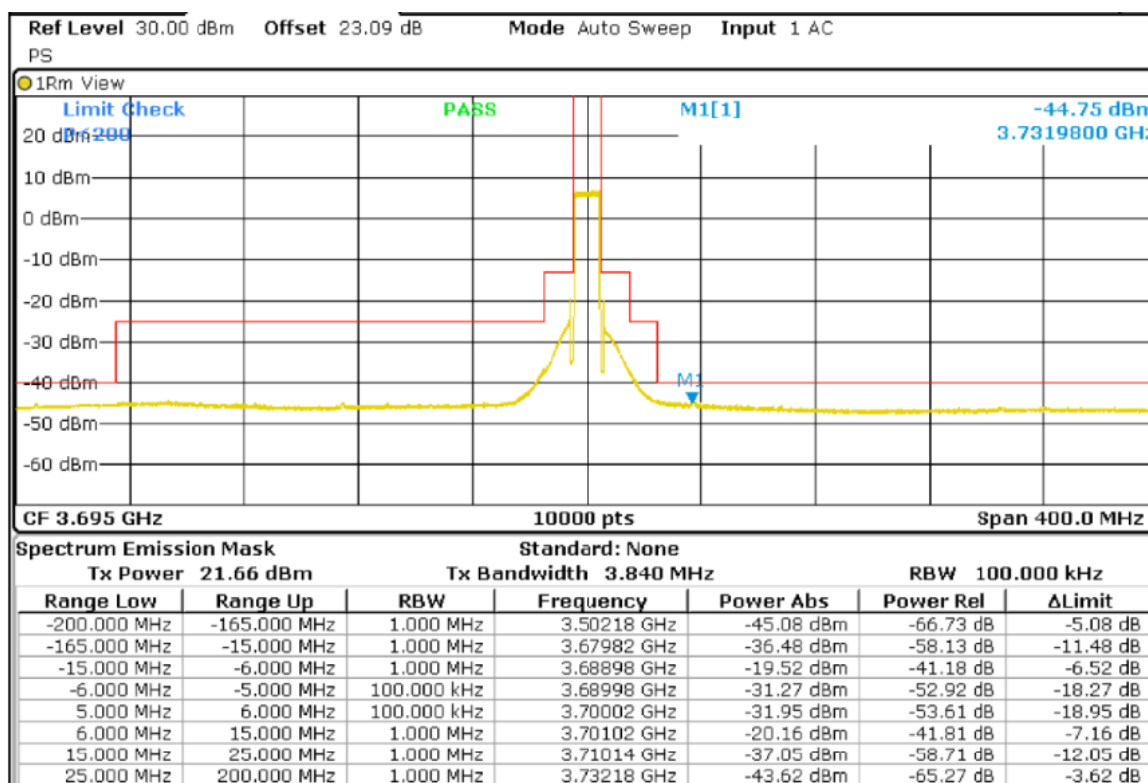
Lowest Channel (3555 MHz)



Middle Channel (3625 MHz)

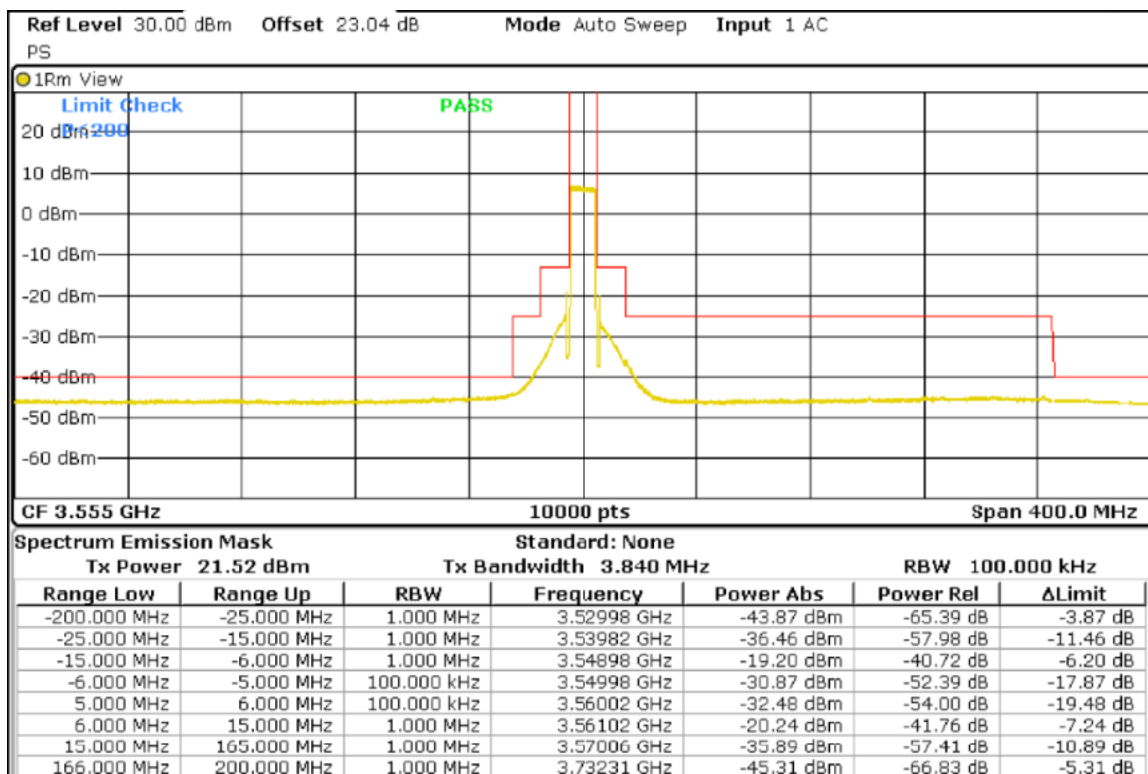


Highest Channel (3695 MHz)

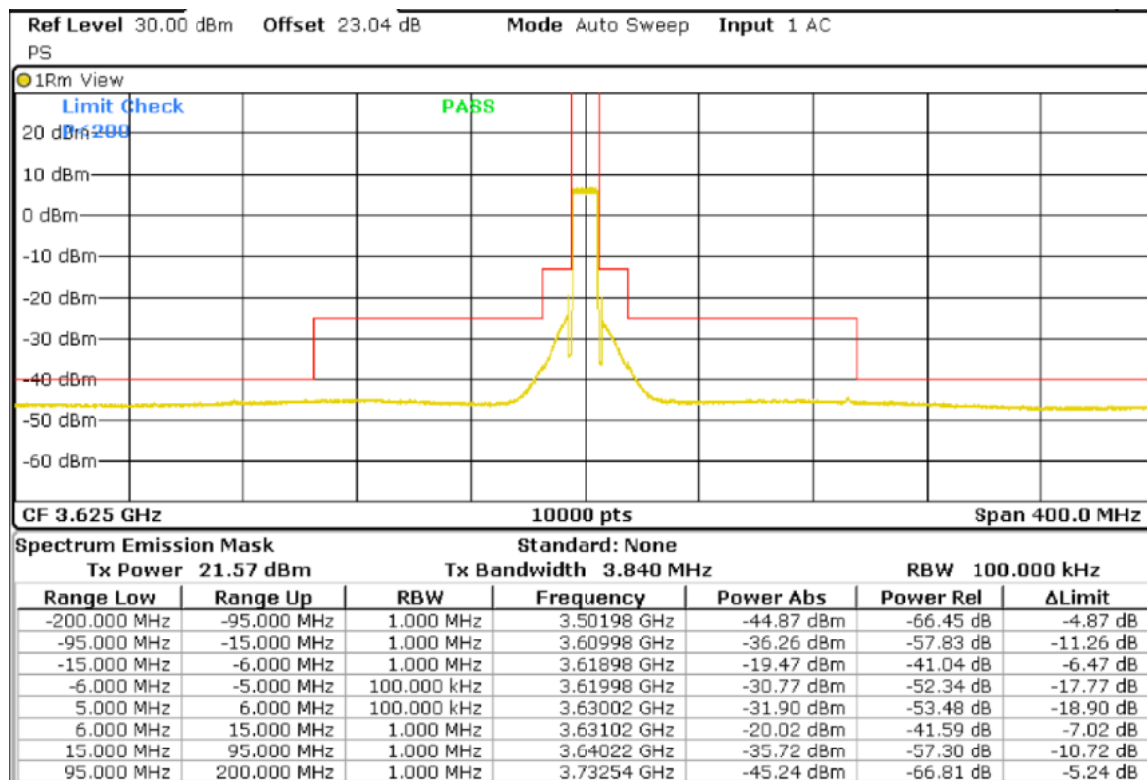


Port 2

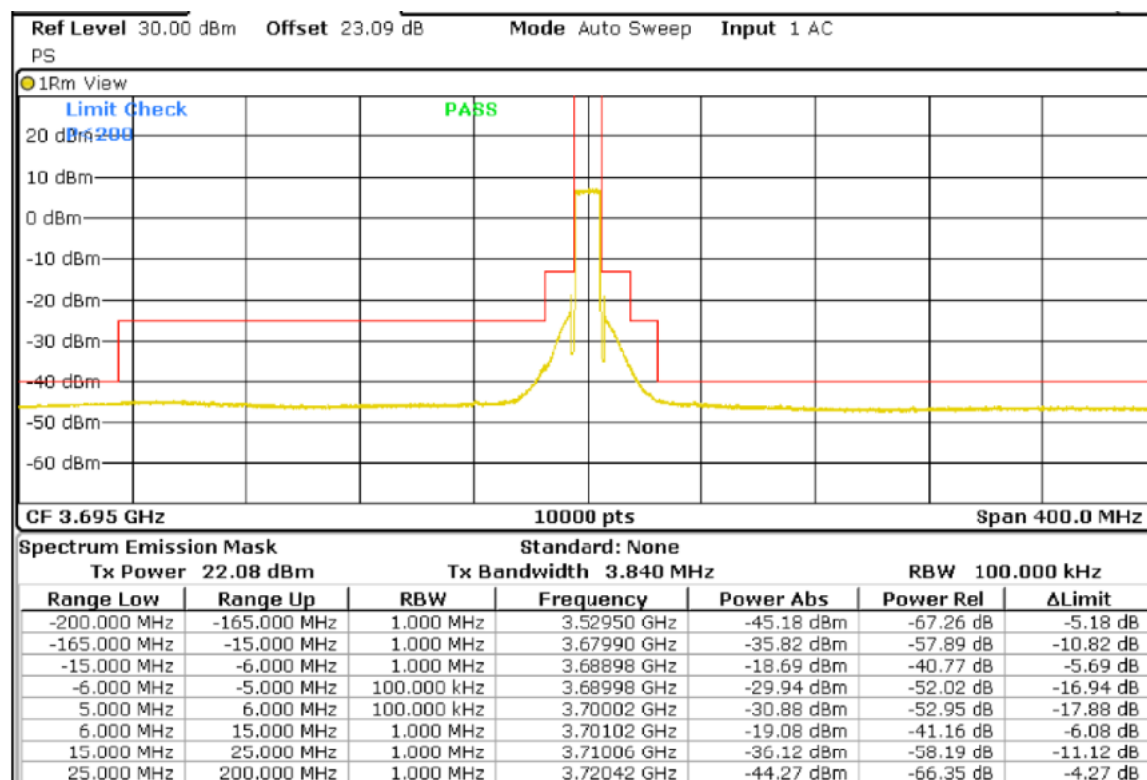
Lowest Channel (3555 MHz)



Middle Channel (3625 MHz)

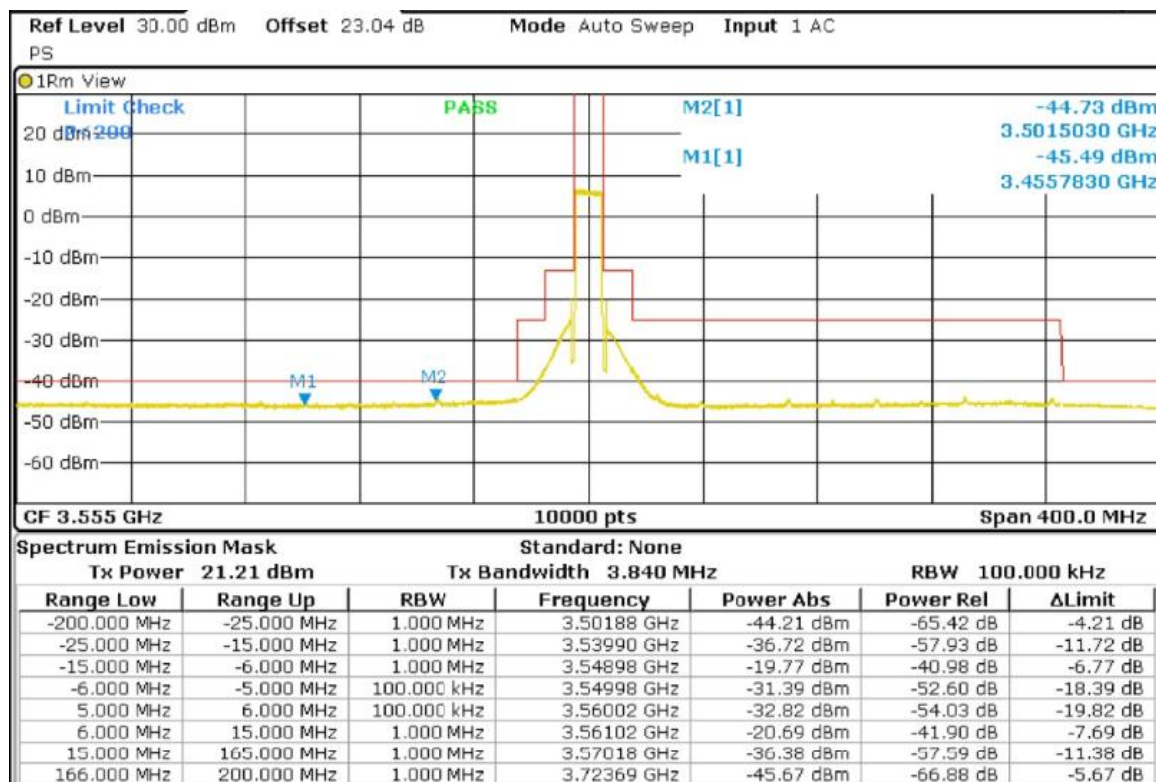


Highest Channel (3695 MHz)

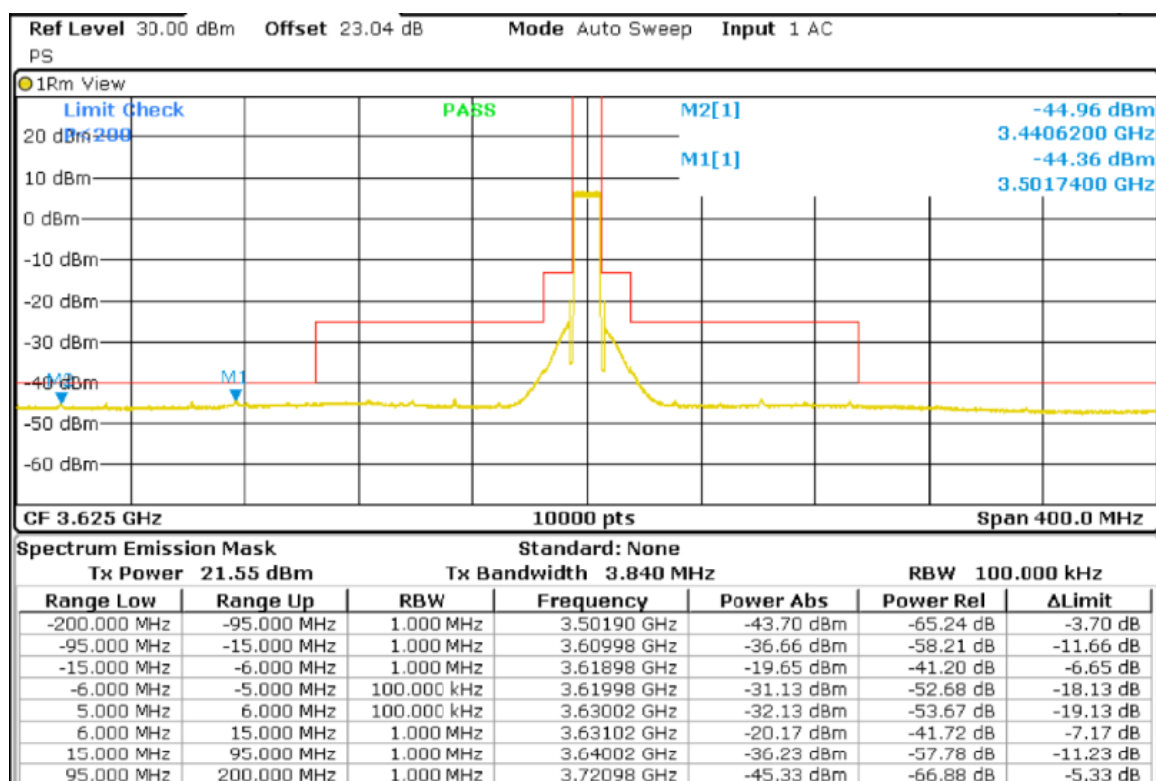


Port 3

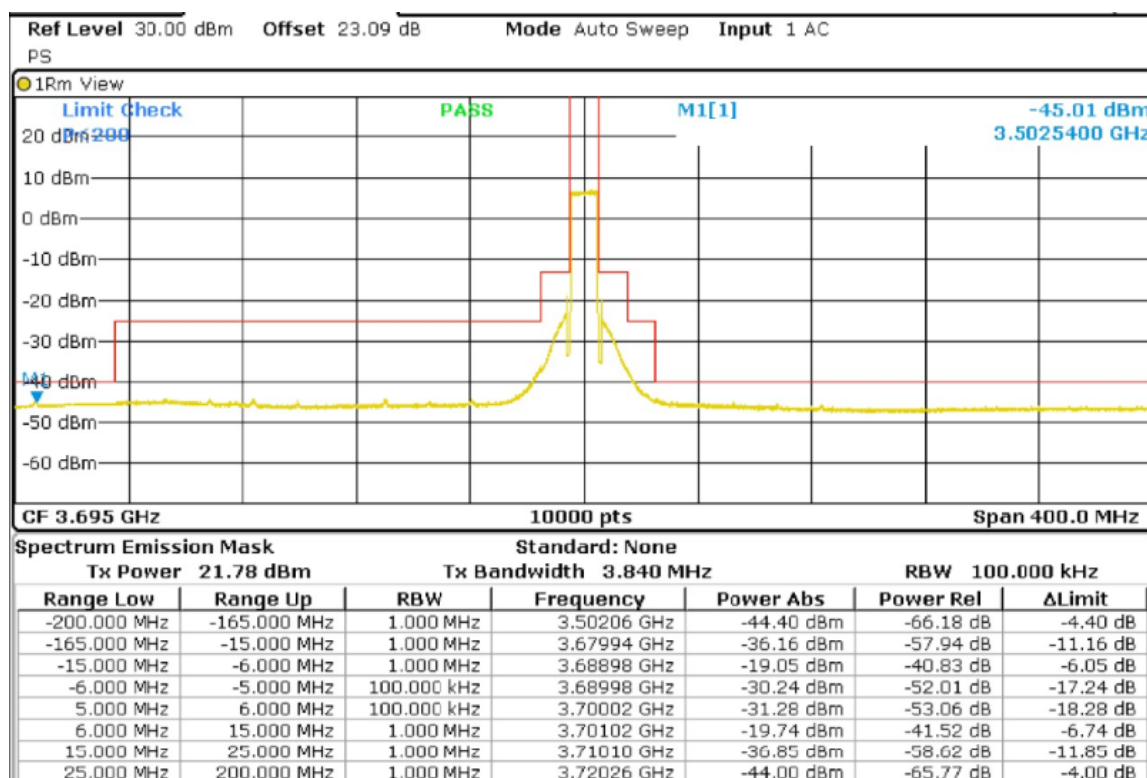
Lowest Channel (3555 MHz)



Middle Channel (3625 MHz)

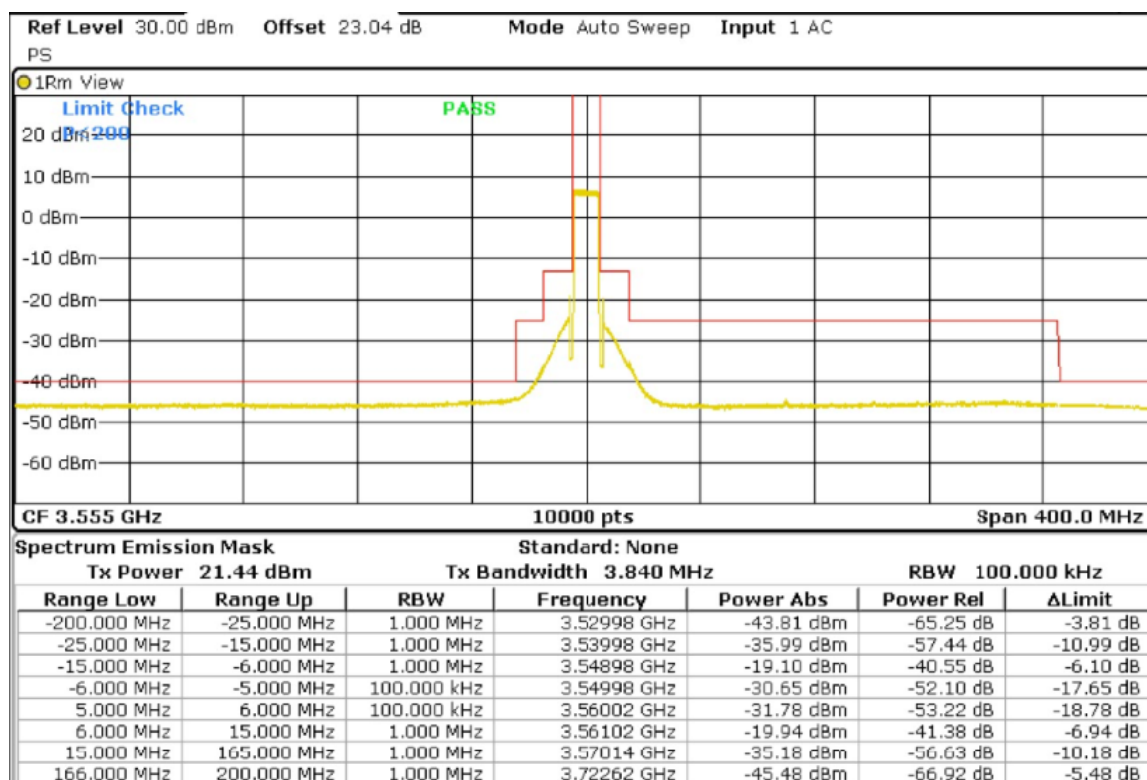


Highest Channel (3695 MHz)

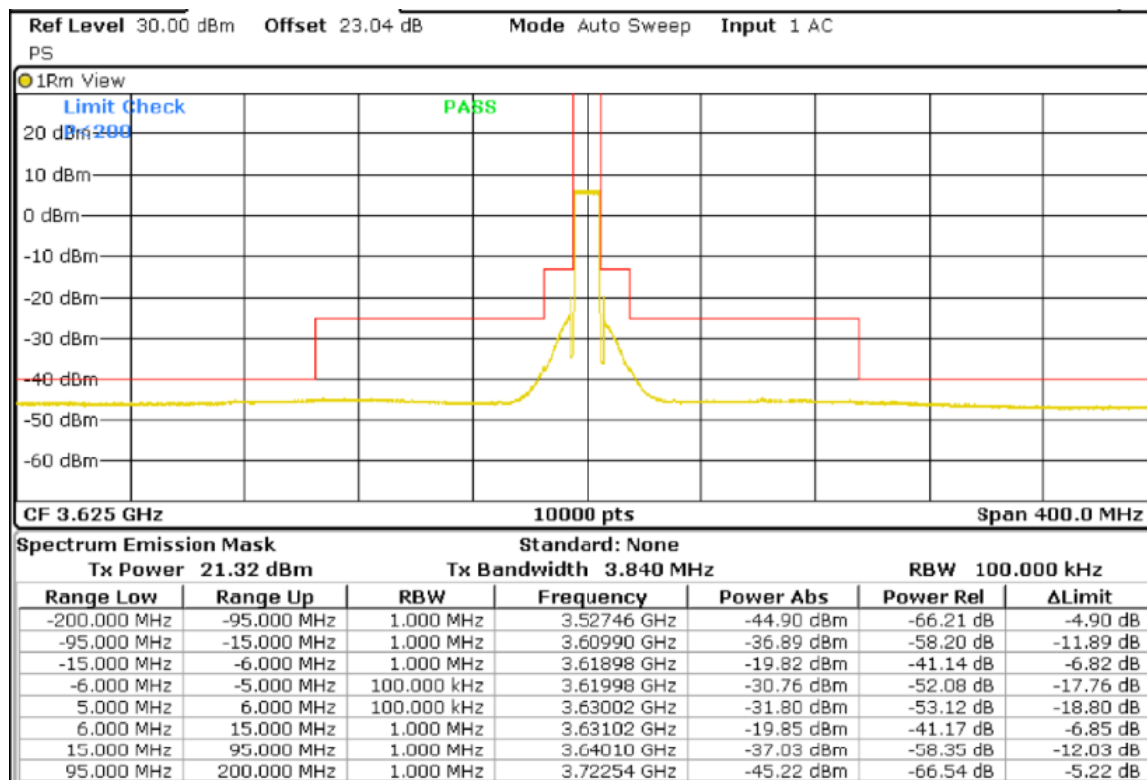


Port 4

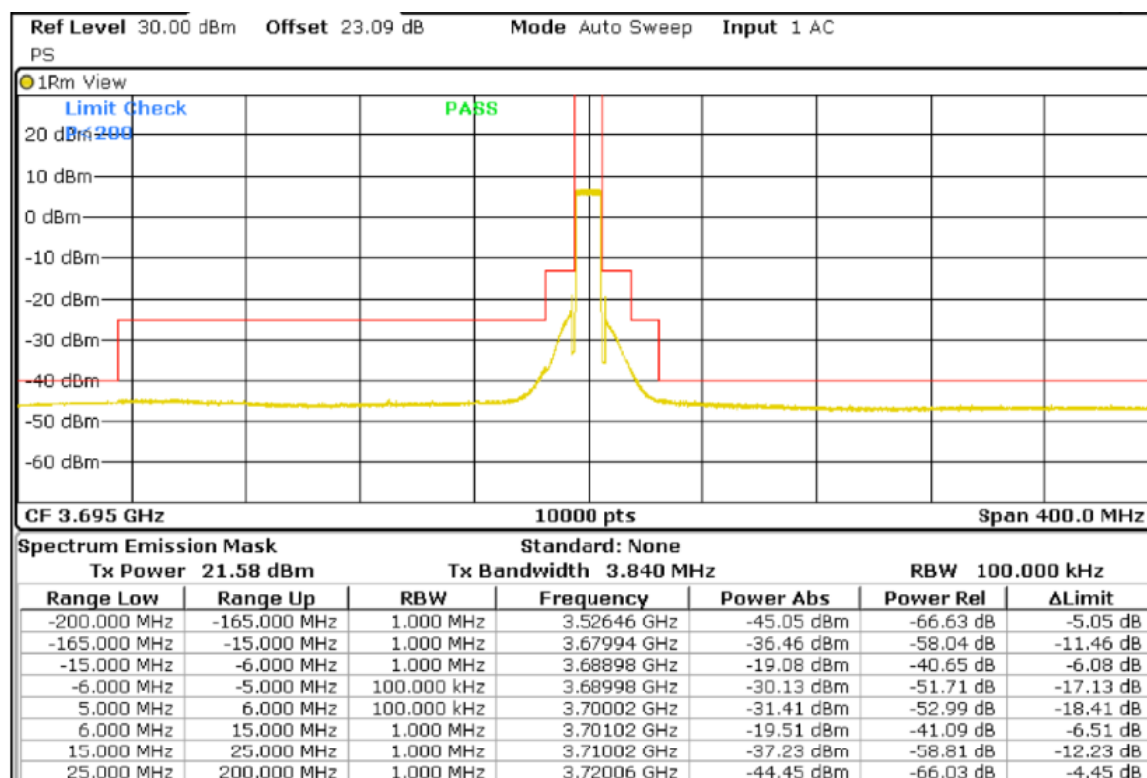
Lowest Channel (3555 MHz)



Middle Channel (3625 MHz)



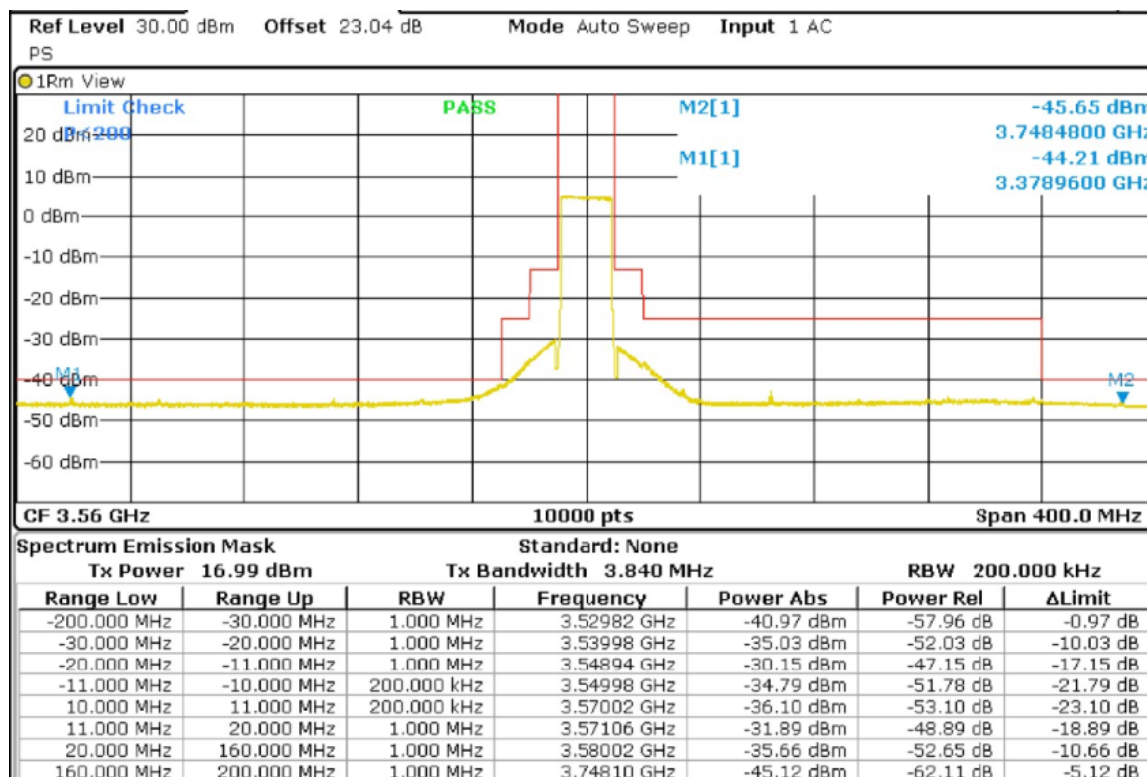
Highest Channel (3695 MHz)



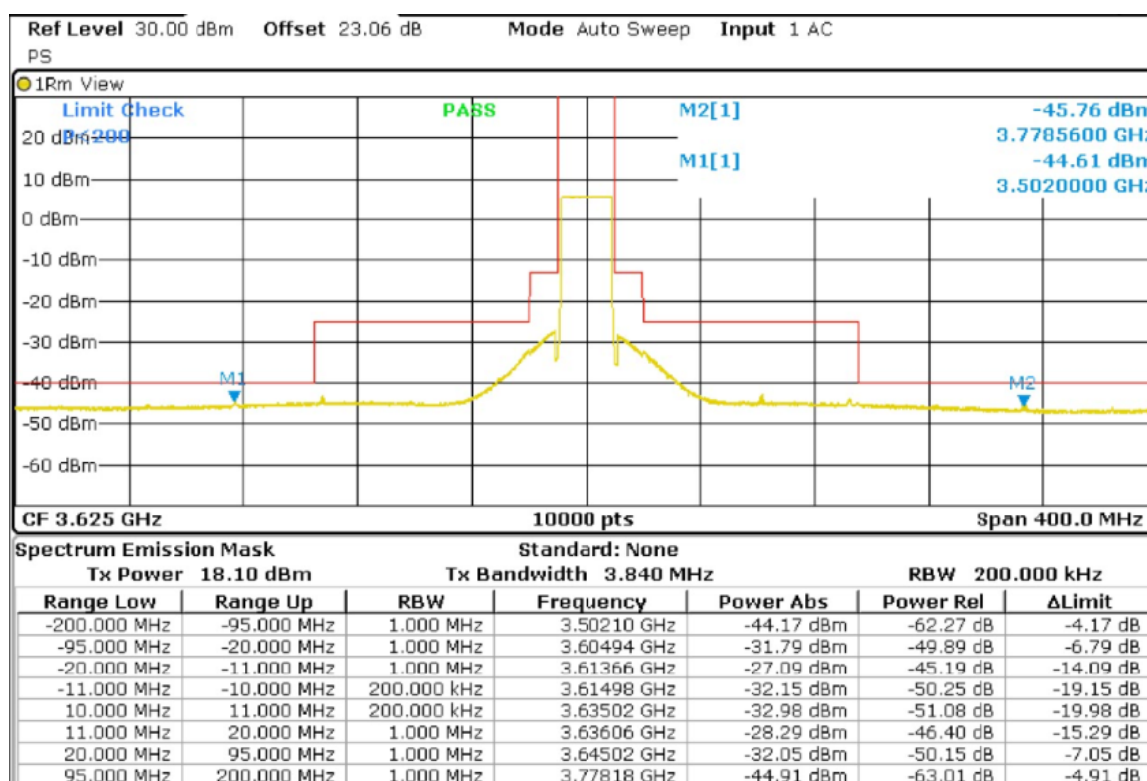
20MHz BW

Port 1

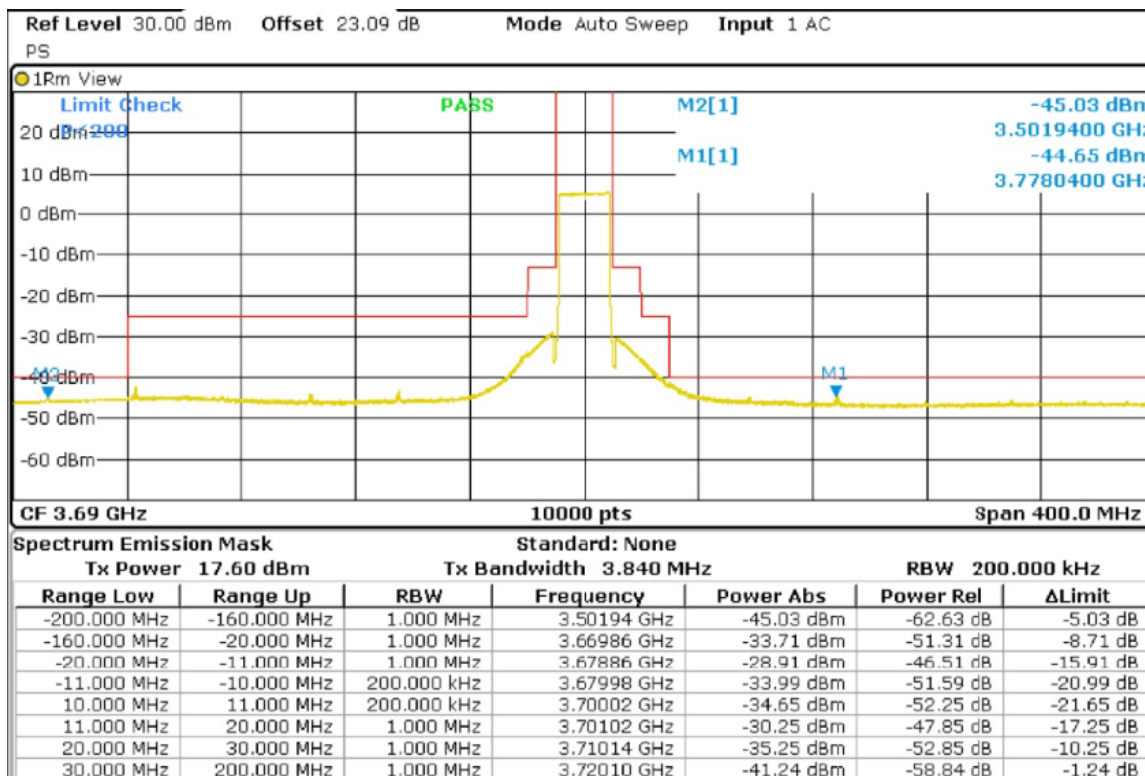
Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)

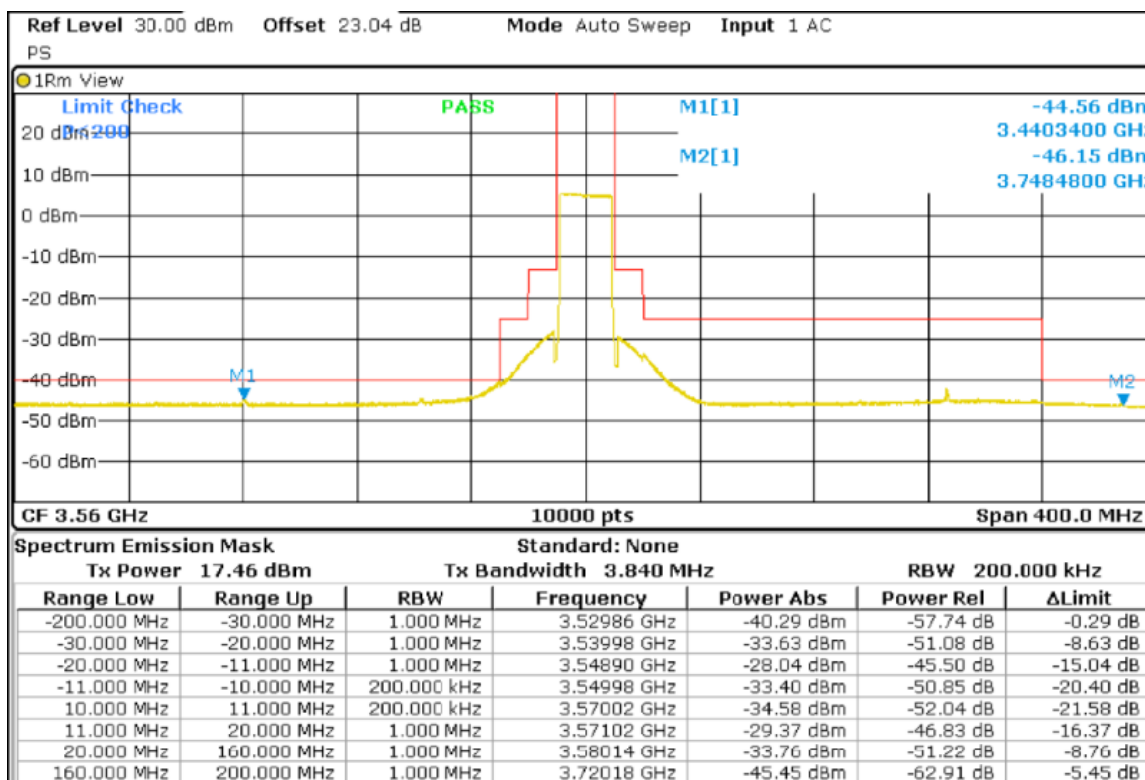


Highest Channel (3690 MHz)

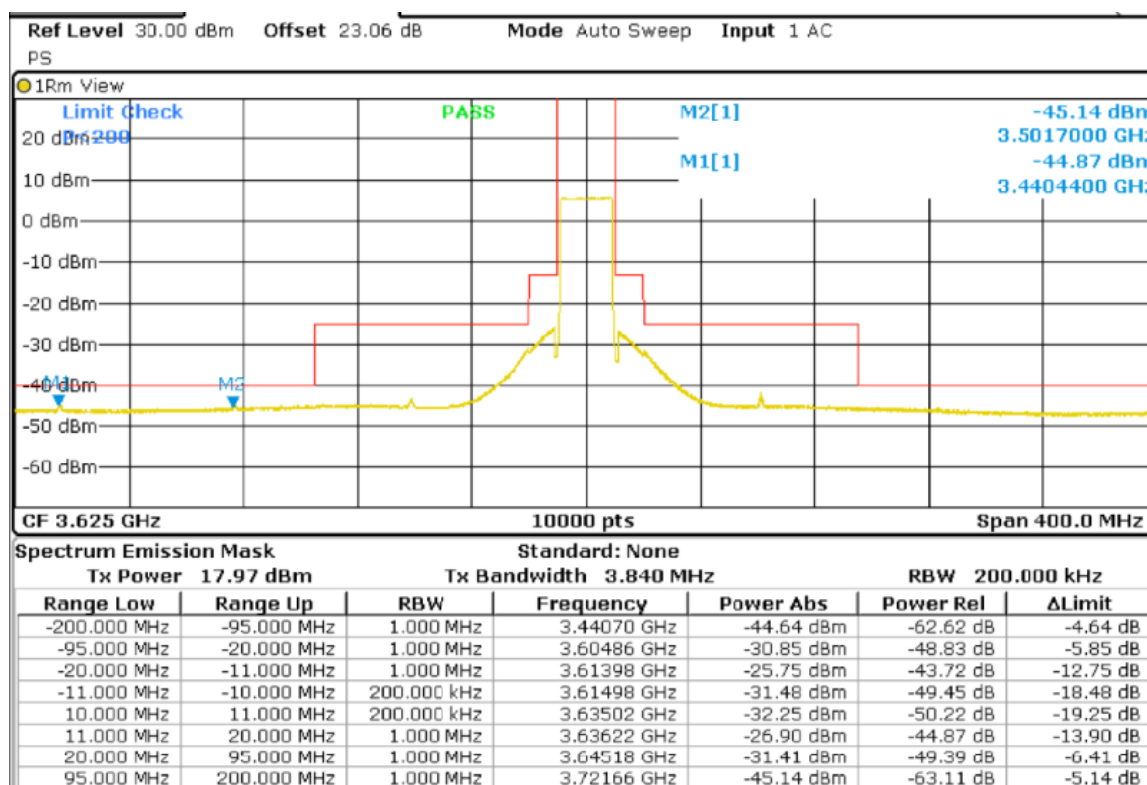


Port 2

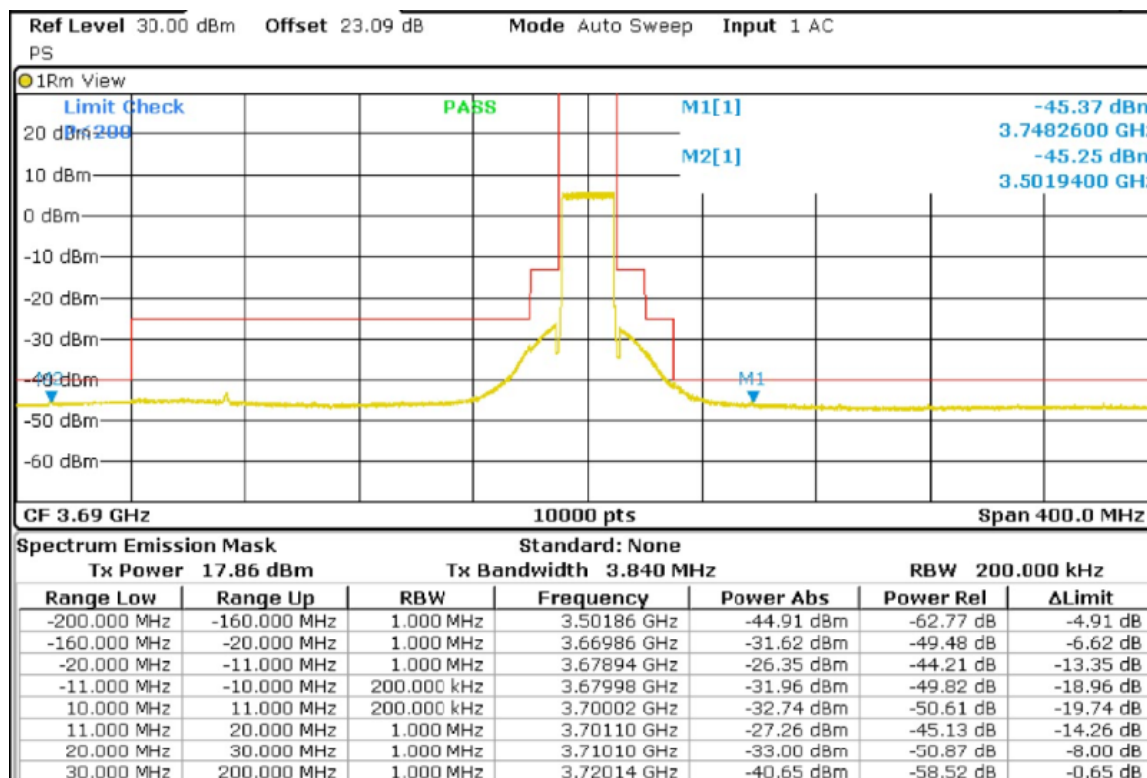
Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)

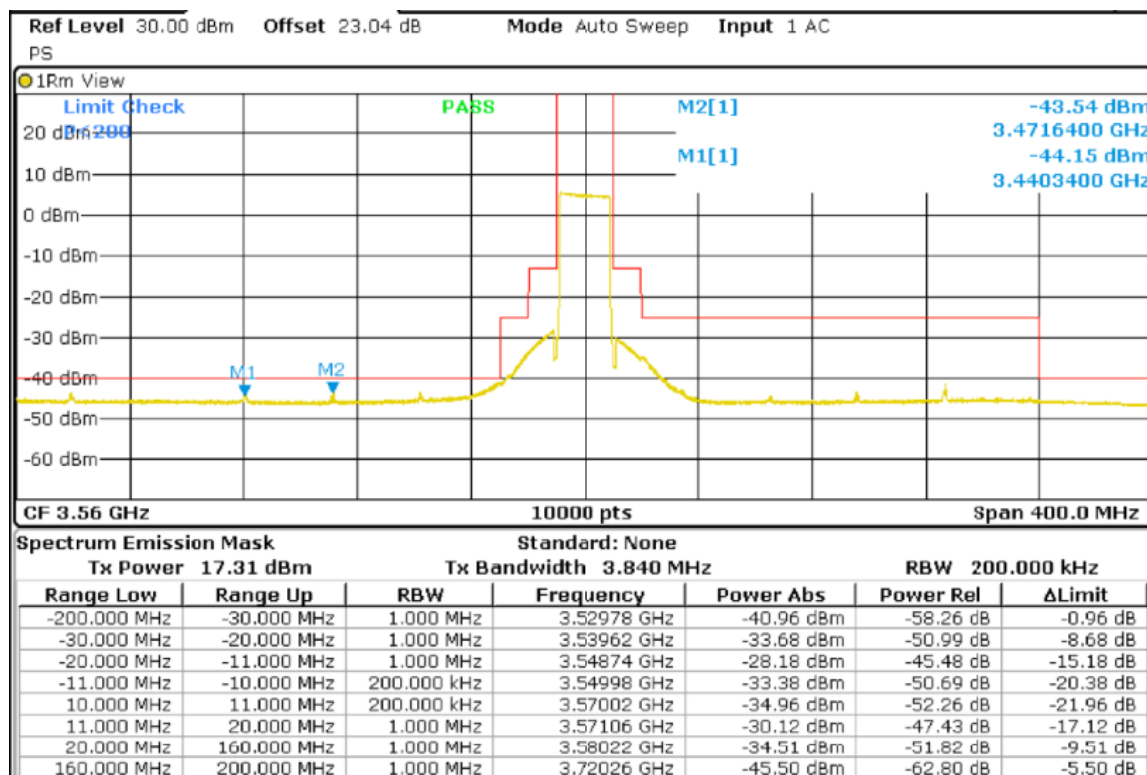


Highest Channel (3690 MHz)

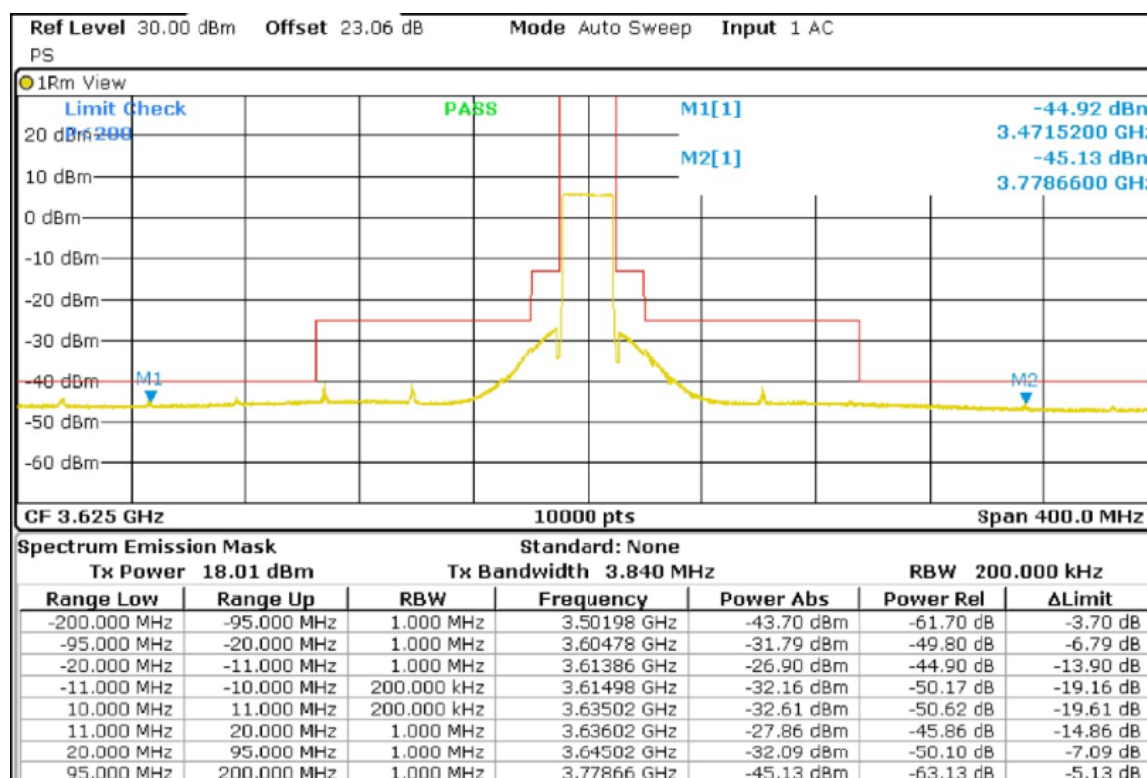


Port 3

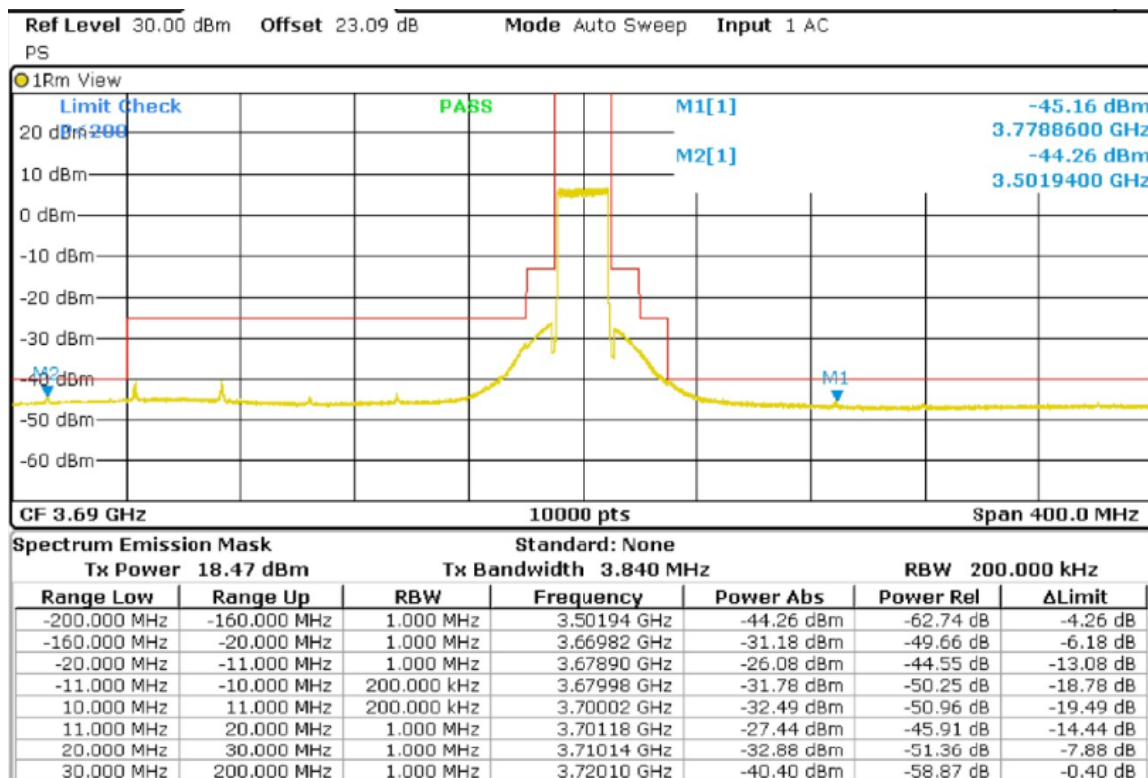
Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)

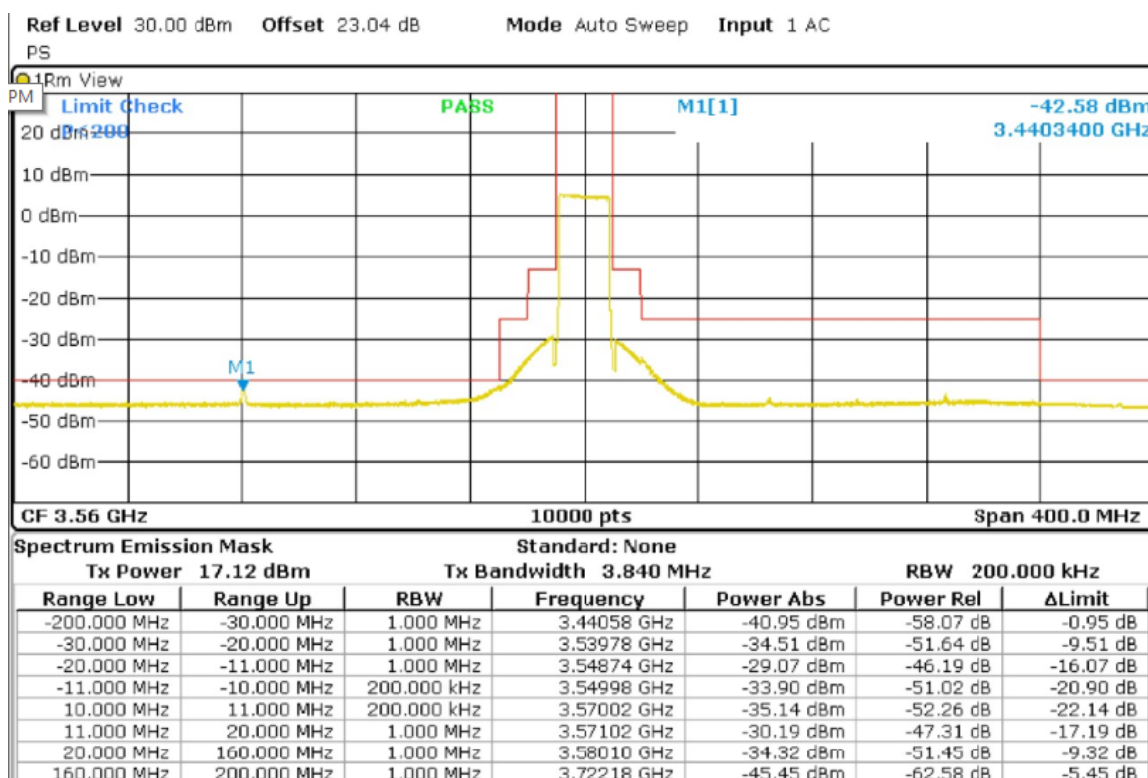


Highest Channel (3690 MHz)

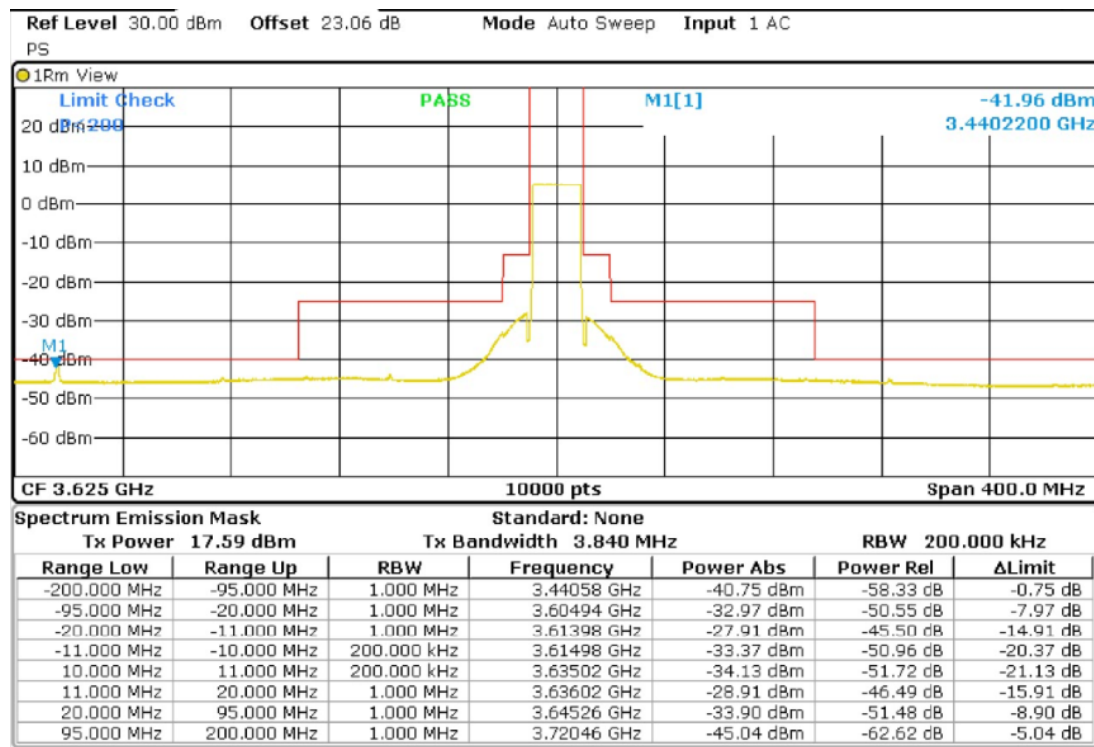


Port 4

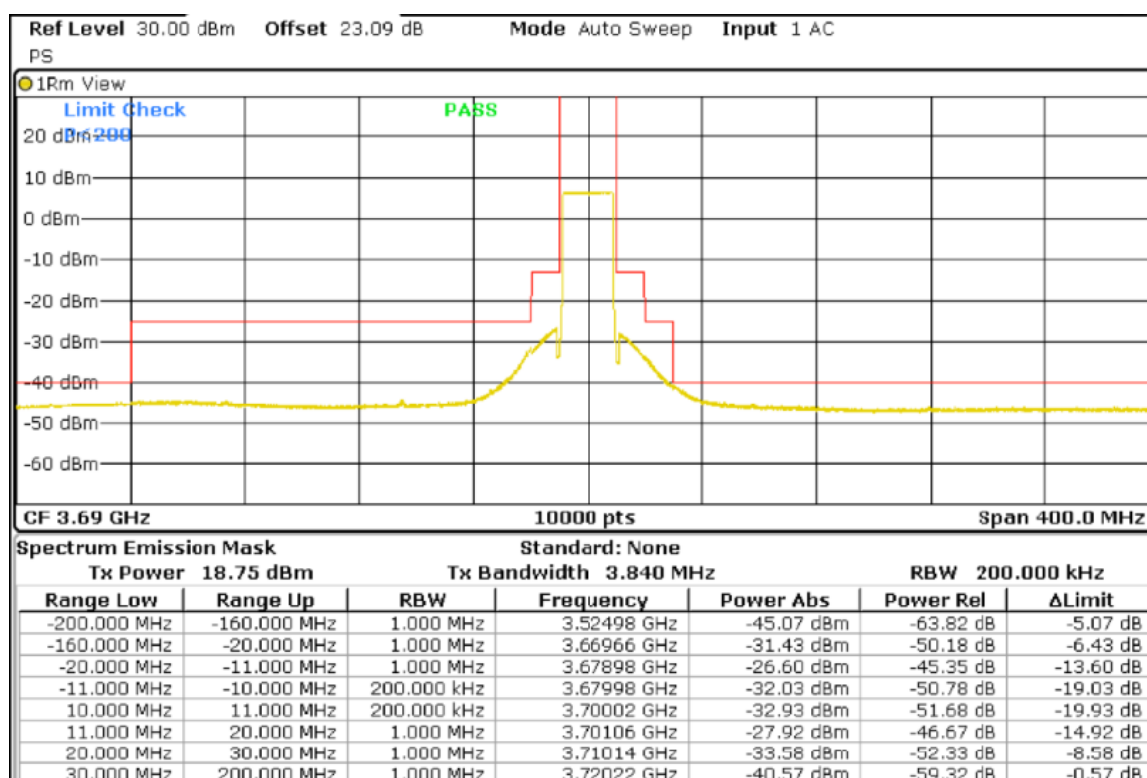
Lowest Channel (3560 MHz)



Middle Channel (3625 MHz)



Highest Channel (3690 MHz)



Section 2.1051 and 96.41 Subclause (e). Spurious Emissions at Antenna Terminals

The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of each harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in § 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.

The limits for emission outside the fundamental for any emission below 3530 MHz and above 3720 MHz are -40 dBm/MHz.

The following 10 log (1/duty cycle) was added in RF level offset to get the accurate measured power level in the average power measurement.

The duty cycle correction = $10 \log (1/0.74) = 1.31 \text{ (dB)}$

The measured values from the two ports were summed by using the measure-and-sum technique in E) 1) of KDB 662911 D01 Multiple Transmitter Output v02r01 and based on two ports, port 1 and 3 (or port 2 and 4) transmitting at the same time in the 2X2 MIMO mode.

RESULTS

2x2 MIMO

10MHz BW

Port 1 and 3

Lowest 3555 MHz		Middle 3625 MHz		Highest 3695 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3194.88	-45.70	3195.04	-44.76	3200.30	-45.71
3317.51	-44.89	3317.98	-43.98	3317.98	-43.40
3317.67	-44.76	3333.54	-44.82	3332.92	-44.41
3317.51/3317.67	-41.81 (*)	3732.55	-42.71	7389.68	-46.95
3732.55	-43.38	7250.18	-47.45	7389.68	-43.77
7109.68	-54.19	7251.18	-47.75	7389.68/7389.68	-42.06 (*)
7109.68	-54.75	7250.18/7251.18	-44.59 (*)		
7109.68/7109.68	-51.45 (*)				
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Port 2 and 4

Lowest 3555 MHz		Middle 3625 MHz		Highest 3695 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3194.88	-45.88	3195.04	-45.99	3194.88	-45.39
3256.20	-43.56	3256.20	-44.14	3317.51	-45.03
3302.57	-44.32	3717.30	-44.79	7389.68	-46.04
3317.51	-45.27	7250.18	-46.97	7390.68	-44.99
7109.68	-53.41	7250.18	-46.63	7389.68/7390.68	-42.47
7109.68	-53.84	7250.18/7250.18	-43.79(*)		
7109.68/7109.68	-50.61 (*)				
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

20MHz BW

Port 1 and 3

Lowest 3560 MHz		Middle 3625 MHz		Highest 3690 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3317.98	-43.43	3195.04	-44.76	3317.67	-43.45
3317.82	-42.78	3317.82	-43.51	3317.67	-42.72
3317.82/3317.98	-40.08(*)	3317.98	-43.98	3317.67/3317.82	-40.06 (*)
3502.17	-44.36	3317.82/3317.98	-40.73(*)	3778.79	-45.23
3778.46	-44.44	3840.40	-45.42	7380.18	-54.80
7116.50	-58.01	7251.18	-51.73	7380.68	-51.10
7120.50	-55.95	7251.18	-50.93	7380.18/7380.68	-49.56 (*)
		7251.18/7251.18	-48.3 (*)		
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Port 2 and 4

Lowest 3560 MHz		Middle 3625 MHz		Highest 3690 MHz	
Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)	Spurious frequency (MHz)	Emission Level (dBm/MHz)
3317.98	-43.69	3317.82	-47.65	3195.20	-47.70
3440.31	-45.01	3379.45	-45.40	3440.45	-43.30
3440.92	-43.51	3440.90	-44.52	3440.76	-44.41
3440.31/3440.92	-41.19 (*)	3440.90	-44.74	3440.45/3440.76	-40.81 (*)
7116.50	-56.57	3440.90/3440.90	-41.62(*)	3563.24	-43.32
7125.18	-57.63	7250.68	-52.68	7380.18	-46.71
		7380.68	-48.11	7380.68	-49.39
				7380.18/7380.68	-44.84 (*)
Measurement uncertainty (dB)				<± 2.03	

*: Emission levels from two different ports were summed due to the frequency separation within 1 MHz

Verdict: PASS

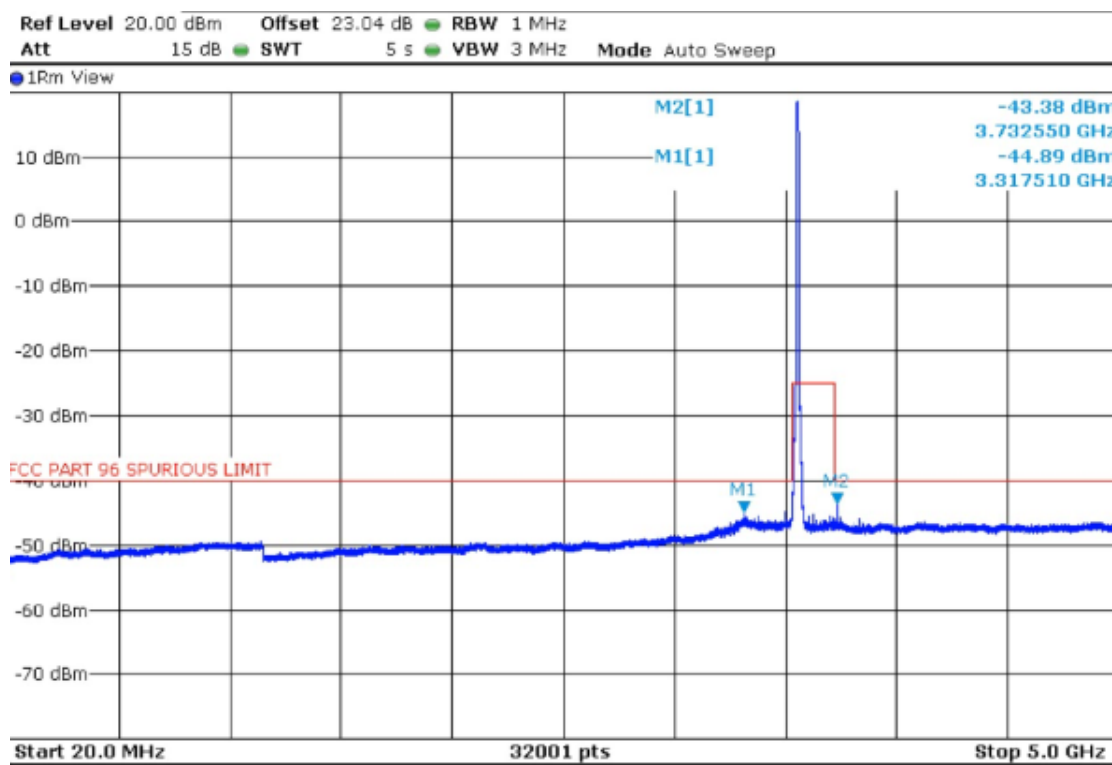
(See the next plots)

10MHz BW

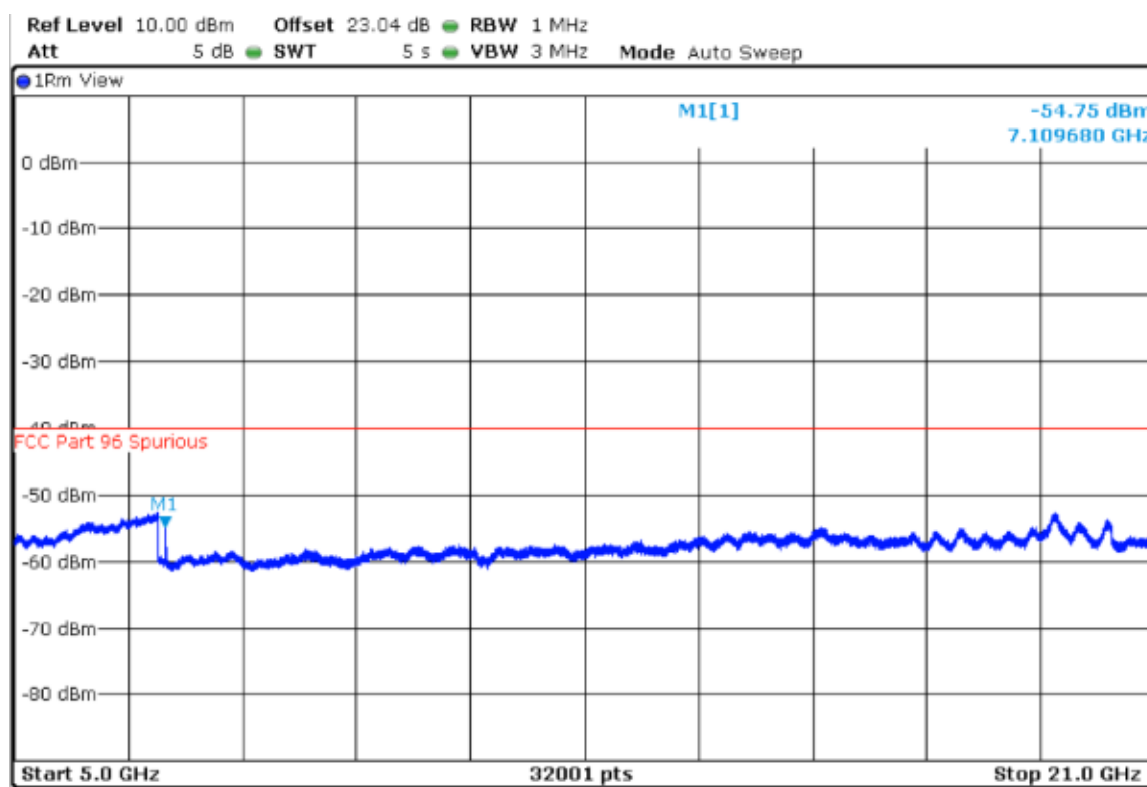
Port 1

Lowest Channel (3555 MHz)

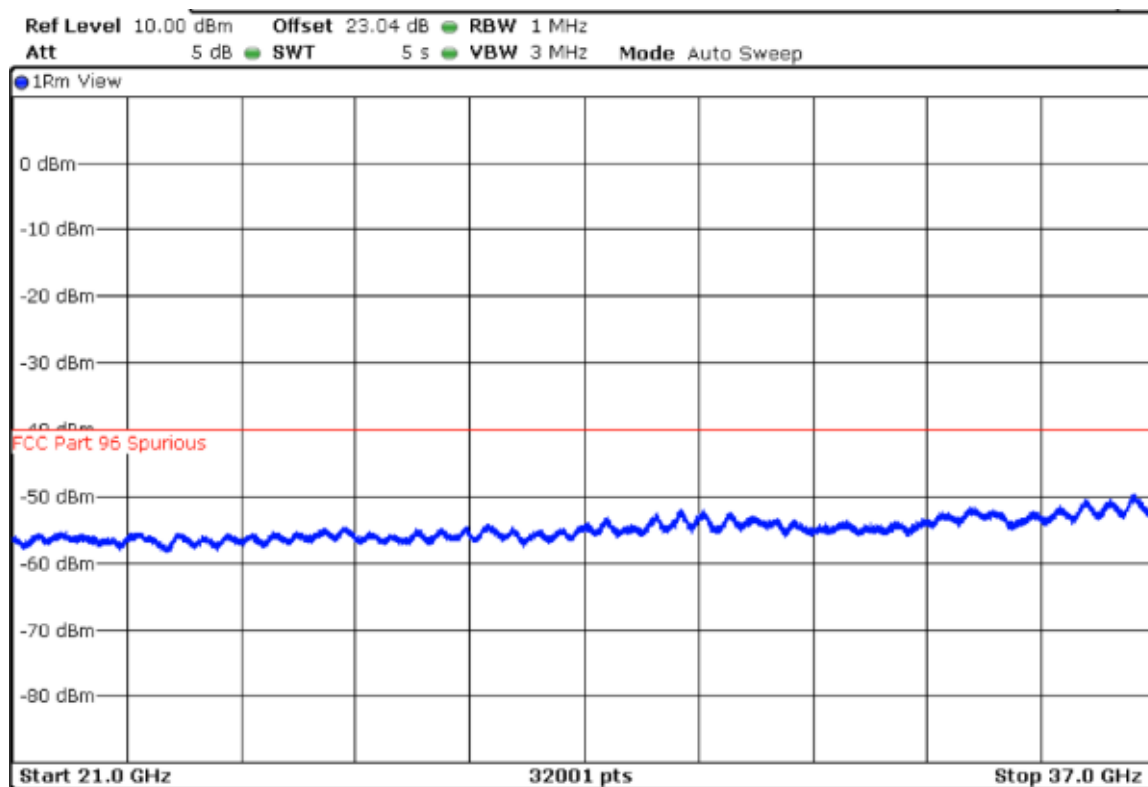
FREQUENCY RANGE 20 MHz-5 GHz



FREQUENCY RANGE 5-21 GHz



FREQUENCY RANGE 21-37 GHz



Middle Channel (3625 MHz)

FREQUENCY RANGE 20 MHz-5 GHz

