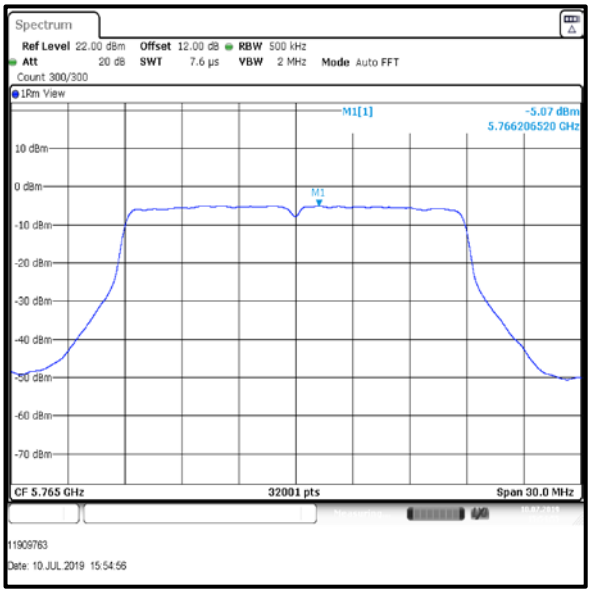
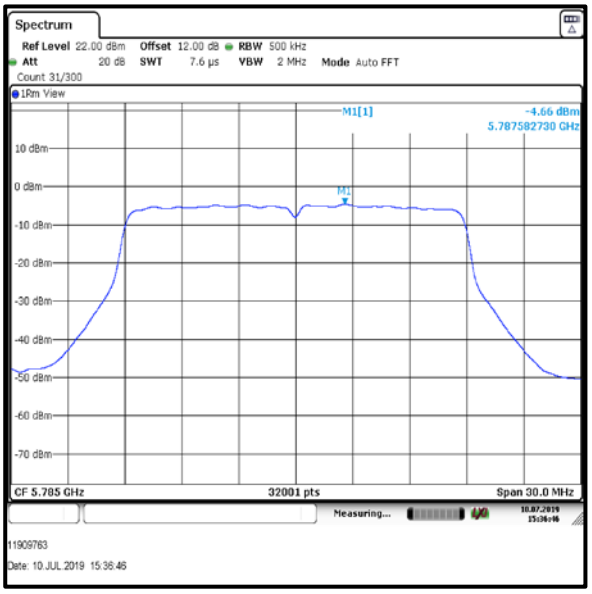
Transmitter Maximum Power Spectral Density (continued)

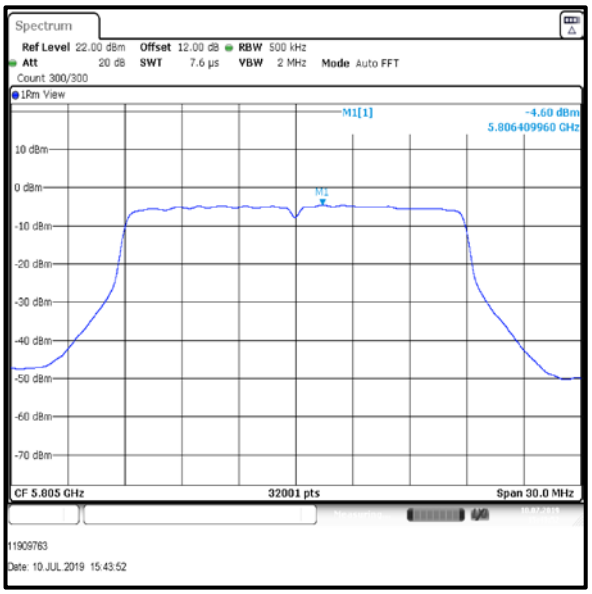
Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 2 / PWL 17 / 23 dBi Antenna Group



Bottom +1 Channel



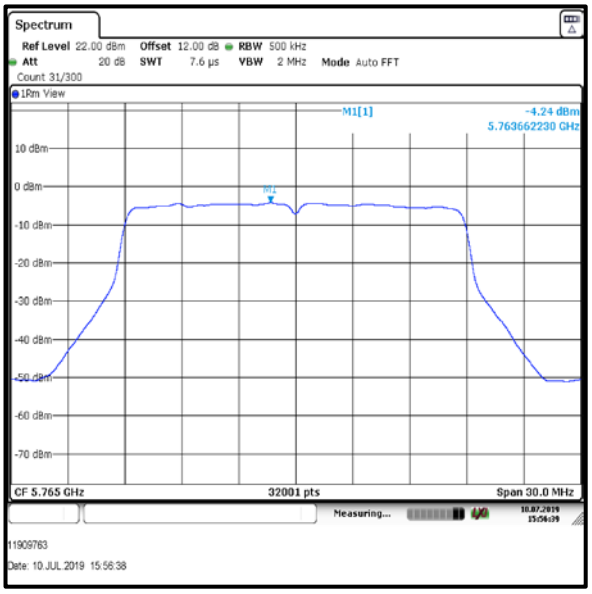
Middle Channel



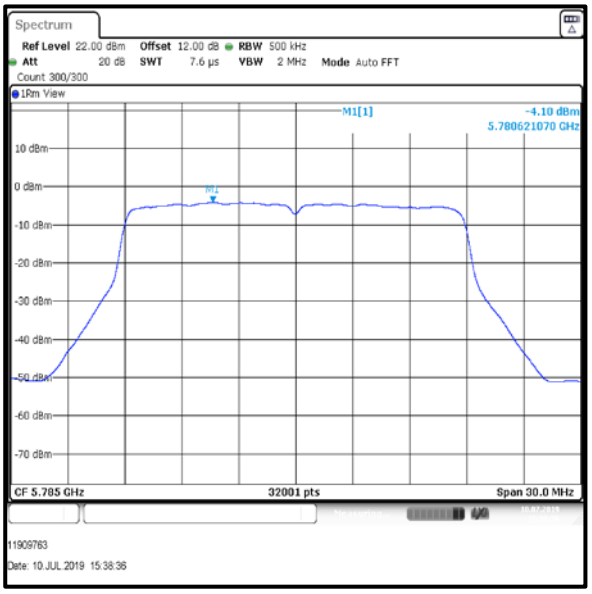
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

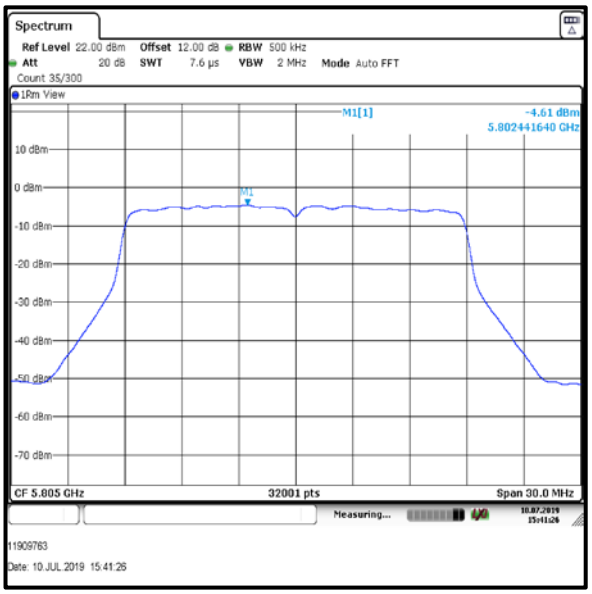
Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 3 / PWL 17 / 23 dBi Antenna Group



Bottom +1 Channel



Middle Channel



Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1+2+3 / PWL 12 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-9.3	0.5	-8.8	-9.9	0.5	-9.4
Top	-9.4	0.5	-8.9	-9.4	0.5	-8.9

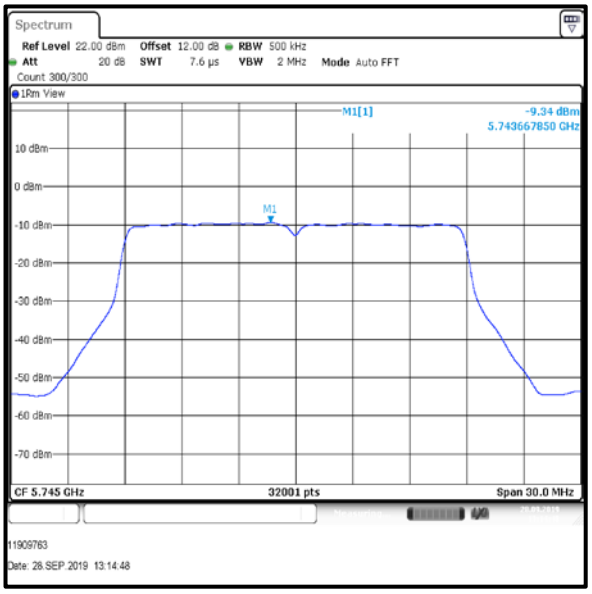
Channel	Port 3		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-9.0	0.5	-8.5
Top	-8.0	0.5	-7.5

Channel	Corrected PPSD Port 1 (dBm /500k Hz)	Corrected PPSD Port 2 (dBm /500k Hz)	Corrected PPSD Port 3 (dBm /500k Hz)	Combined PPSD (dBm /500k Hz)	Limit (dBm/500k Hz)	Margin (dB)	Result
Bottom	-8.8	-9.4	-8.5	-4.1	17.0	21.1	Complied
Top	-8.9	-8.9	-7.5	-3.6	17.0	20.6	Complied

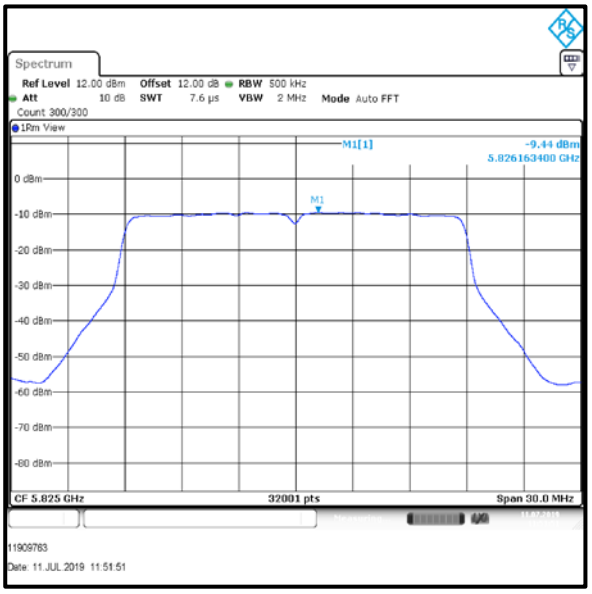
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1 / PWL 12 / 23 dBi Antenna Group

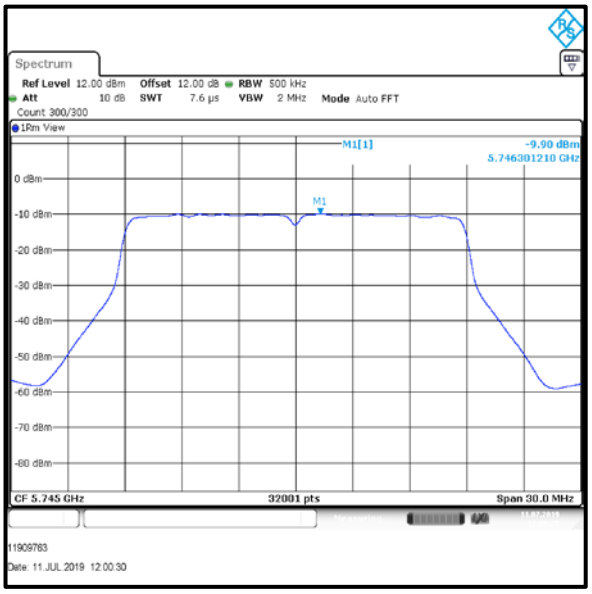


Bottom Channel

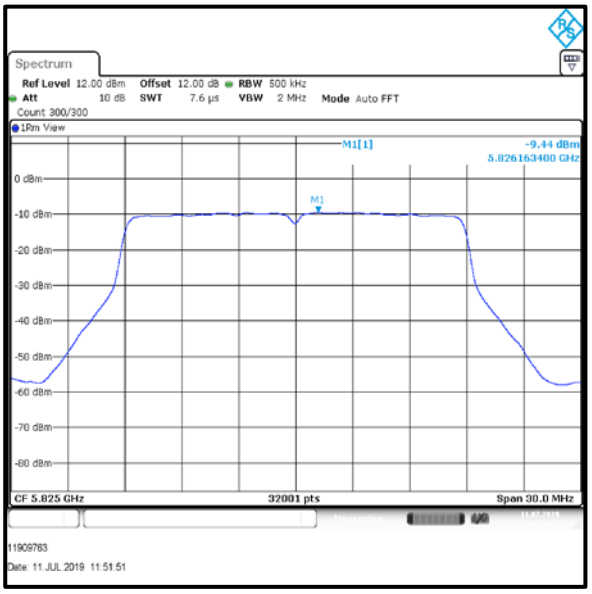


Top Channel

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 2 / PWL 12 / 23 dBi Antenna Group



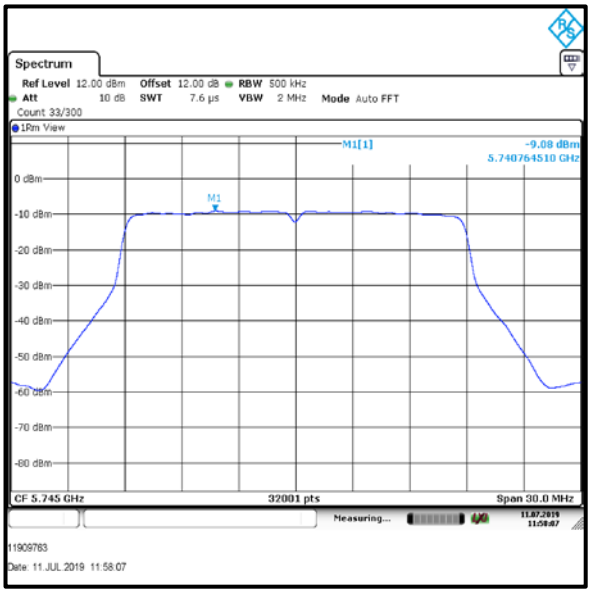
Bottom Channel



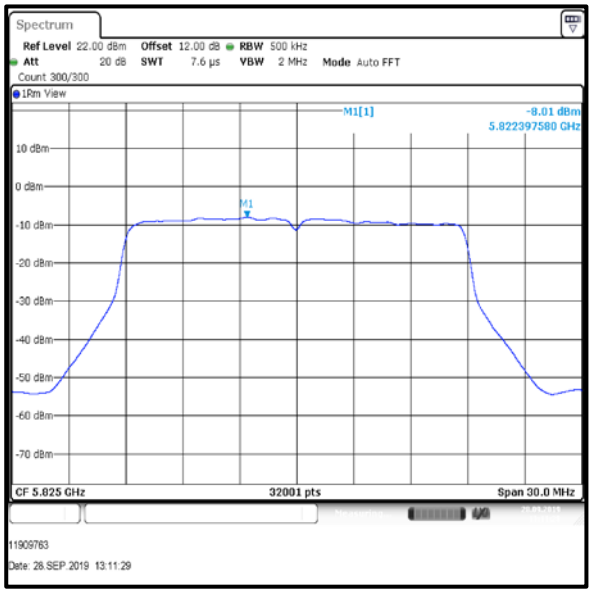
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 3 / PWL 12 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1+2+3 / PWL 17 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)
Bottom+1	-4.2	0.4	-3.8	-2.7	0.4	-2.3
Middle	-4.1	0.4	-3.7	-2.5	0.4	-2.1
Top -1	-4.2	0.4	-3.8	-2.5	0.4	-2.1

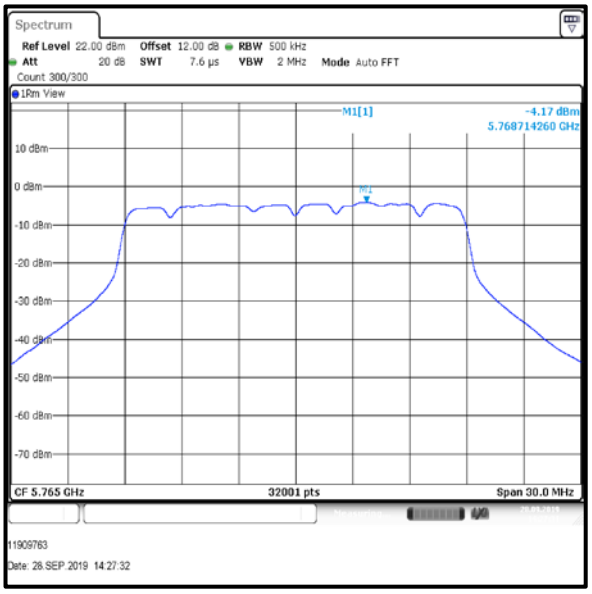
Channel	Port 3		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom+1	-2.7	0.4	-2.3
Middle	-2.0	0.4	-1.6
Top -1	-2.4	0.4	-2.0

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom+1	-3.8	-2.3	-2.3	2.0	17.0	15	Complied
Middle	-3.7	-2.1	-1.6	2.4	17.0	14.6	Complied
Top -1	-3.8	-2.1	-2.0	2.2	17.0	14.8	Complied

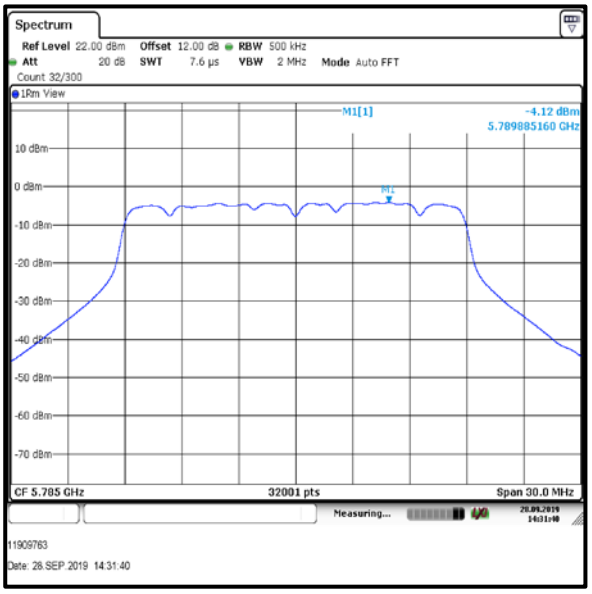
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

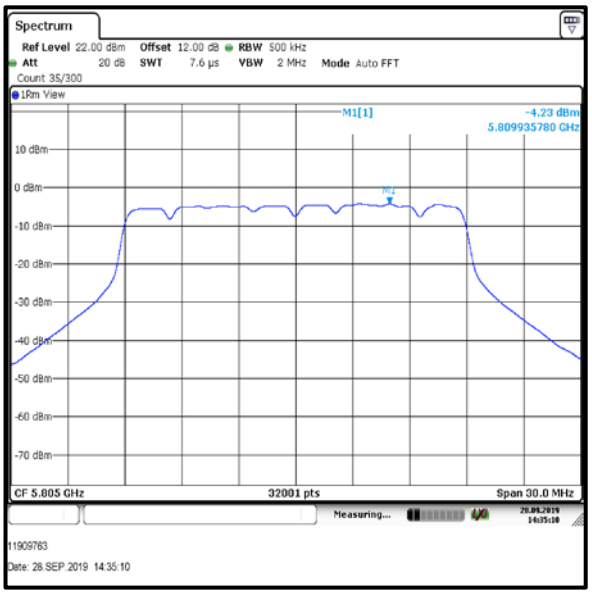
Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1 / PWL 17 / 23 dBi Antenna Group



Bottom +1 Channel



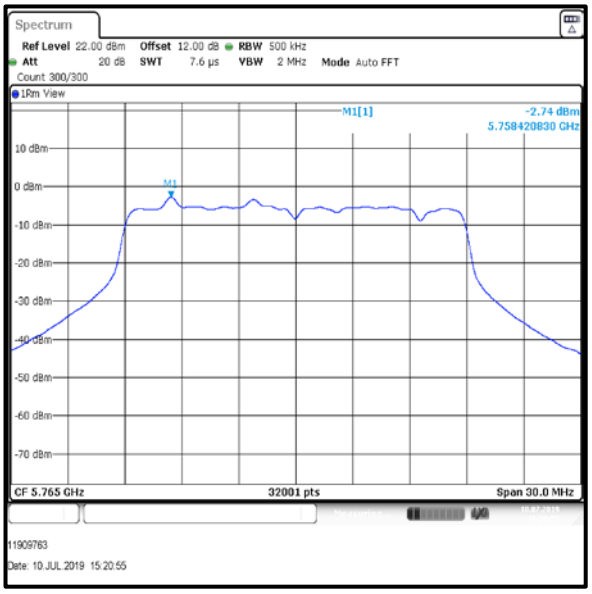
Middle Channel



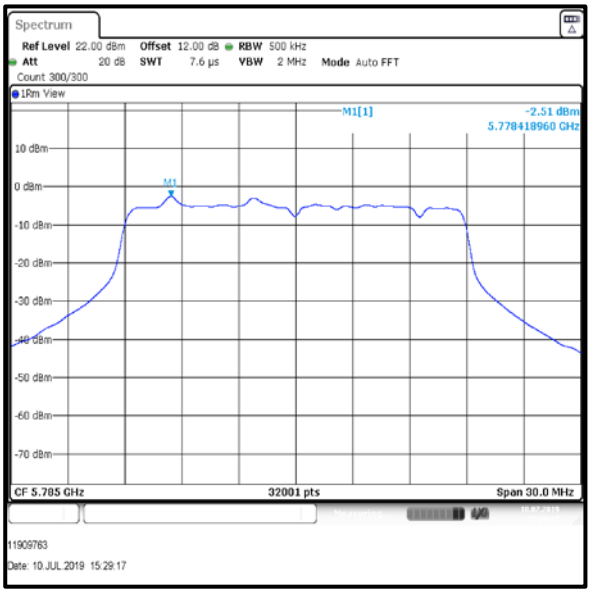
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

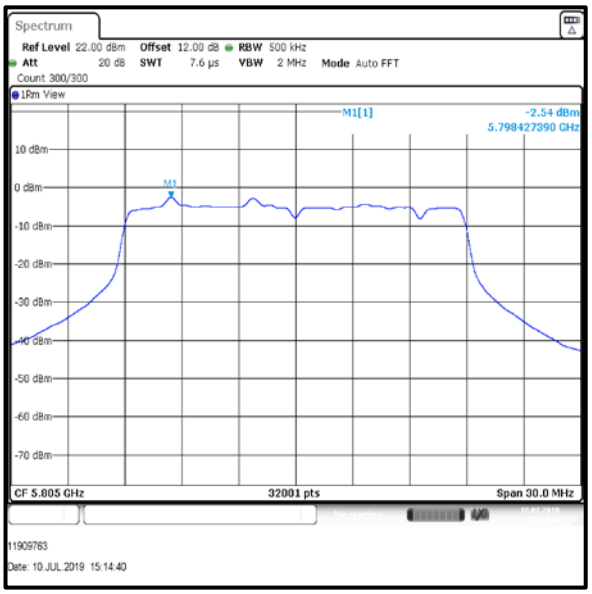
Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 2 / PWL 17 / 23 dBi Antenna Group



Bottom +1 Channel



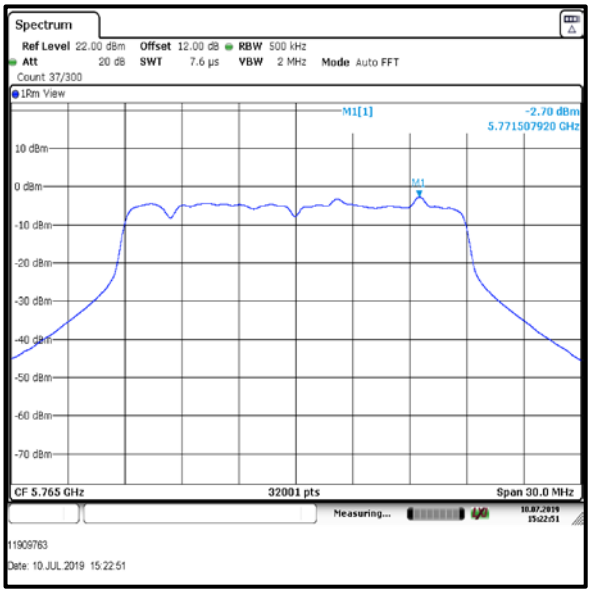
Middle Channel



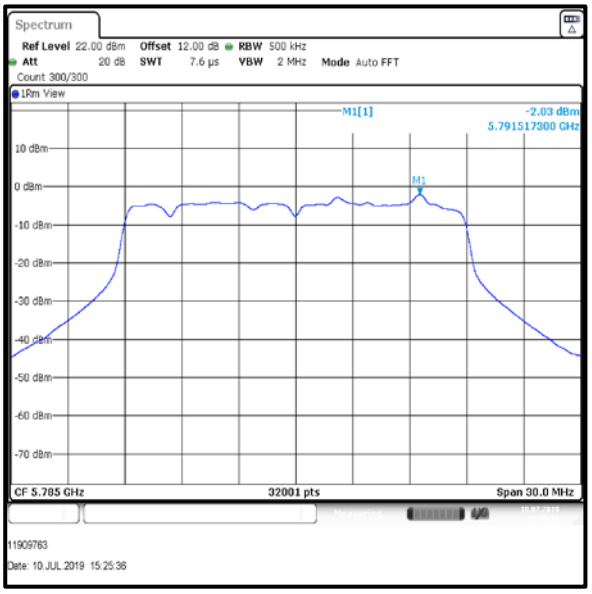
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

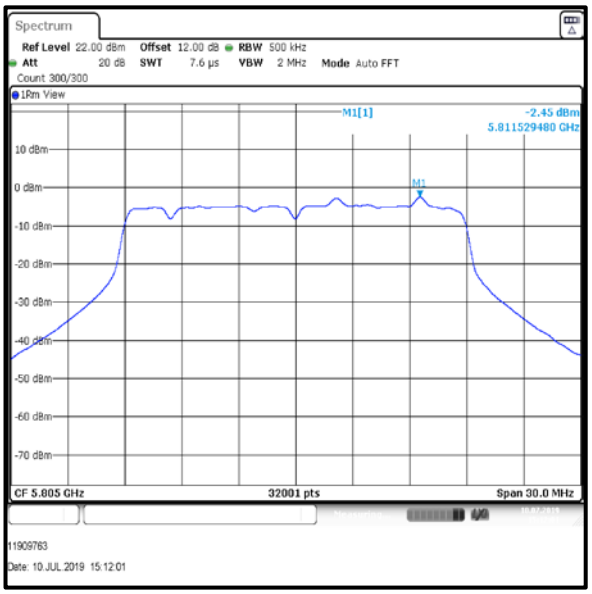
Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 3 / PWL 17 / 23 dBi Antenna Group



Bottom +1 Channel



Middle Channel



Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1+2+3 / PWL12 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-9.1	0.4	-8.7	-7.2	0.4	-6.8
Top	-9.4	0.4	-9.0	-6.7	0.4	-6.3

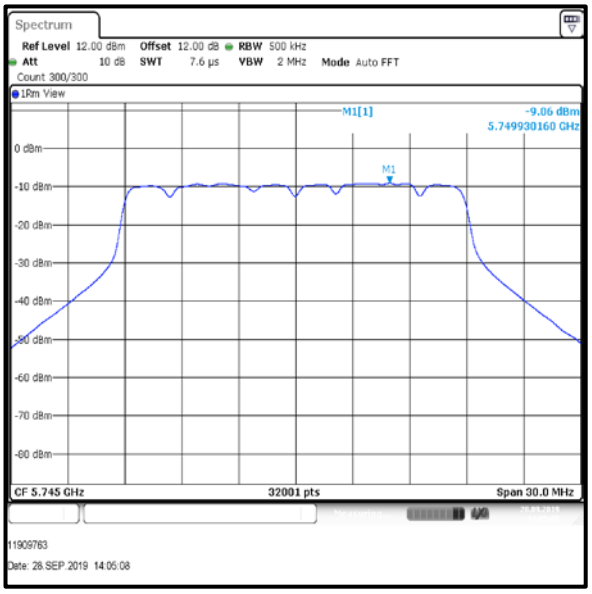
Channel	Port 3		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-6.4	0.4	-6.0
Top	-6.2	0.4	-5.8

Channel	Corrected PPSD Port 1 (dBm /500k Hz)	Corrected PPSD Port 2 (dBm /500k Hz)	Corrected PPSD Port 3 (dBm /500k Hz)	Combined PPSD (dBm /500k Hz)	Limit (dBm/500k Hz)	Margin (dB)	Result
Bottom	-8.7	-6.8	-6.0	-2.3	17.0	19.3	Complied
Top	-9.0	-6.3	-5.8	-2.1	17.0	19.1	Complied

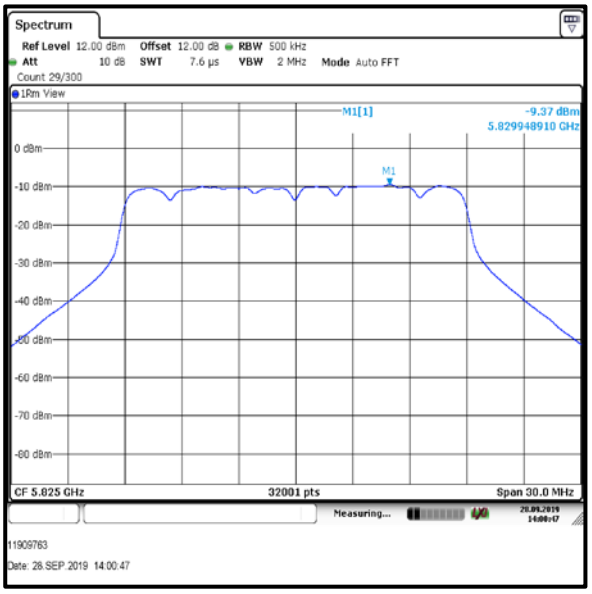
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1 / PWL 12 / 23 dBi Antenna Group

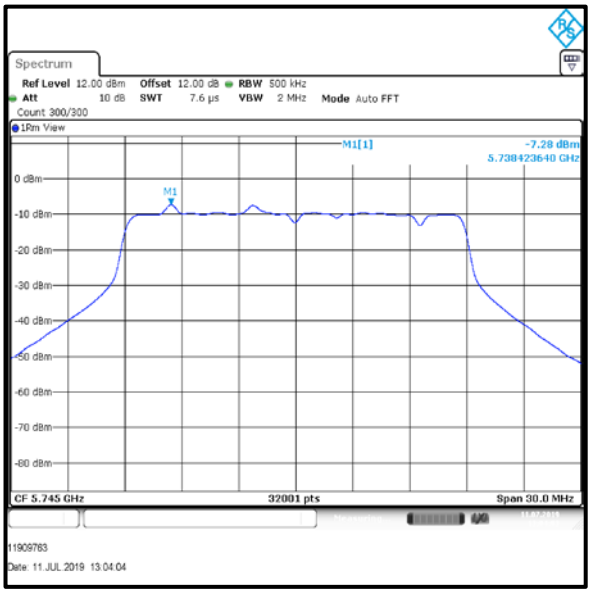


Bottom Channel

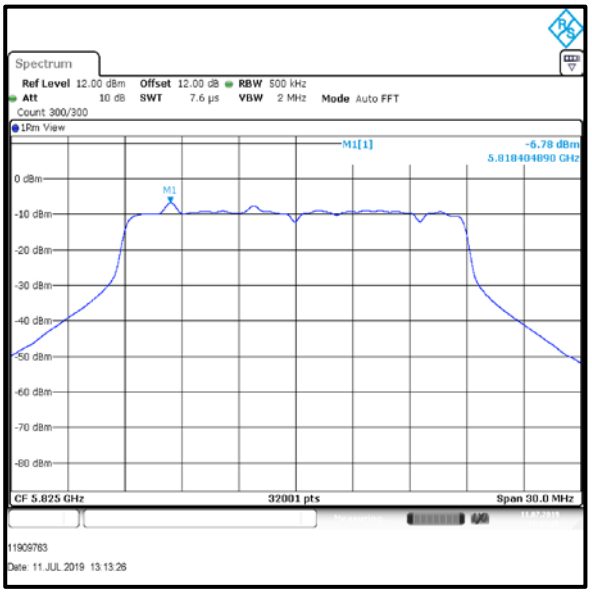


Top Channel

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 2 / PWL 12 / 23 dBi Antenna Group



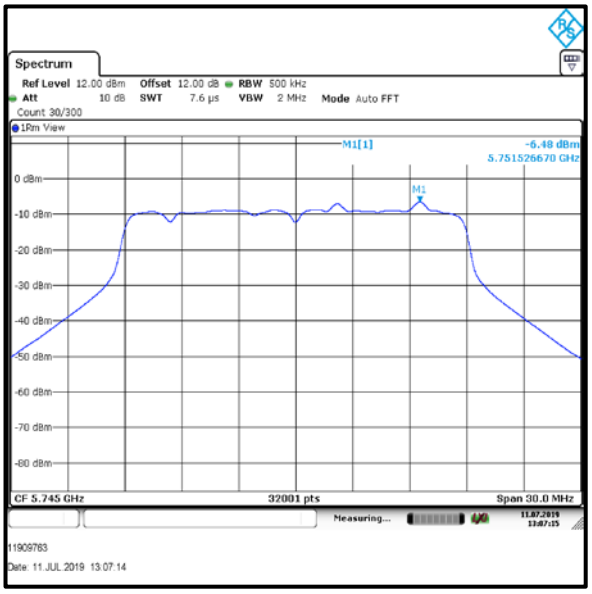
Bottom Channel



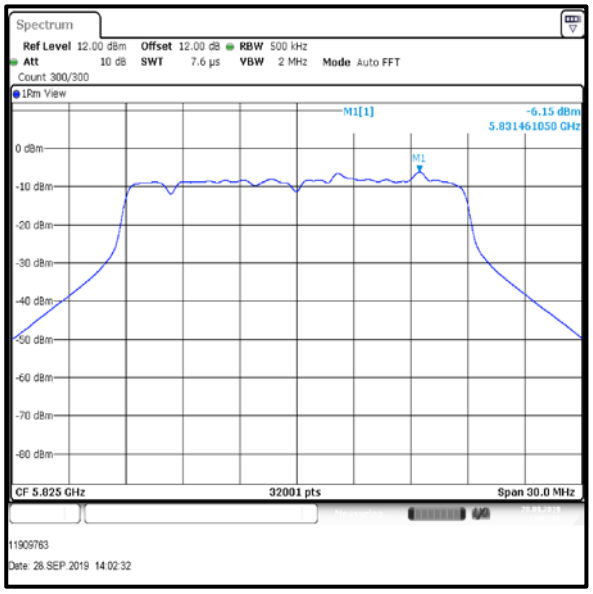
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 3 / PWL 12 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 1+2+3 / PWL 12 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-12.3	0.4	-11.9	-12.9	0.4	-12.5
Top	-12.7	0.4	-12.3	-12.7	0.4	-12.3

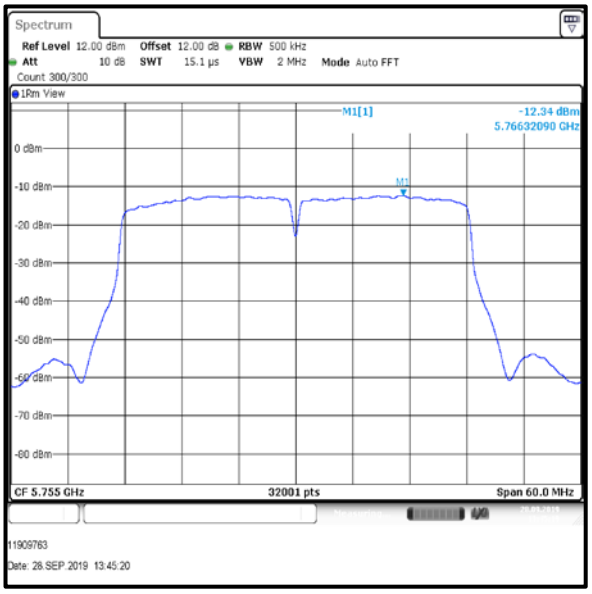
Channel	Port 3		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-12.3	0.4	-11.9
Top	-12.2	0.4	-11.8

Channel	Corrected PPSD Port 1 (dBm /500k Hz)	Corrected PPSD Port 2 (dBm /500k Hz)	Corrected PPSD Port 3 (dBm /500k Hz)	Combined PPSD (dBm /500k Hz)	Limit (dBm/500k Hz)	Margin (dB)	Result
Bottom	-11.9	-12.5	-11.9	-7.3	17.0	24.3	Complied
Top	-12.3	-12.3	-11.8	-7.4	17.0	24.4	Complied

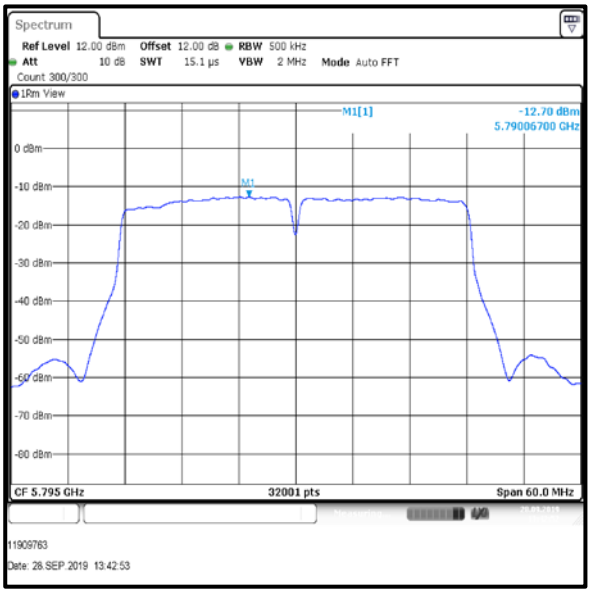
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 1 / PWL 12 / 23 dBi Antenna Group

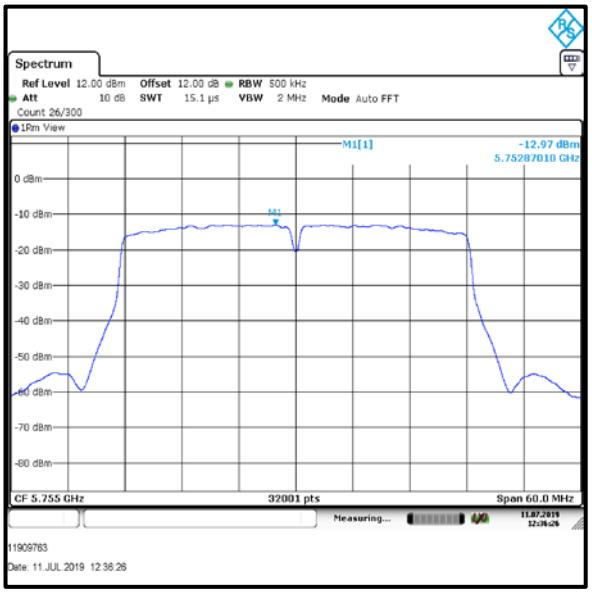


Bottom Channel

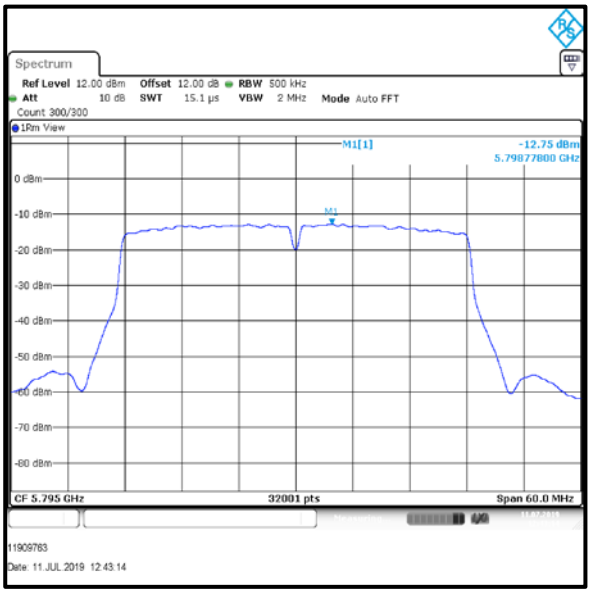


Top Channel

Results: 802.11n / HT40 / MCS0 / MIMO / Port 2 / PWL 12 / 23 dBi Antenna Group



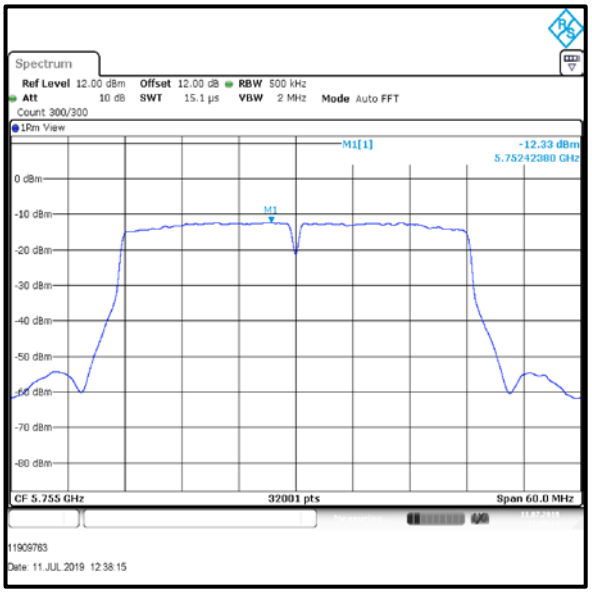
Bottom Channel



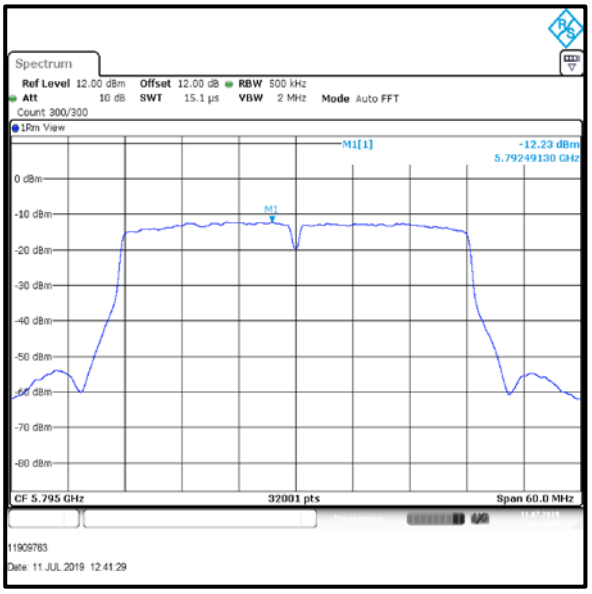
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 3 / PWL 12 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 1+2+3 / PWL 12 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-13.2	0.4	-12.8	-11.5	0.4	-11.1
Top	-13.6	0.4	-13.2	-11.3	0.4	-10.9

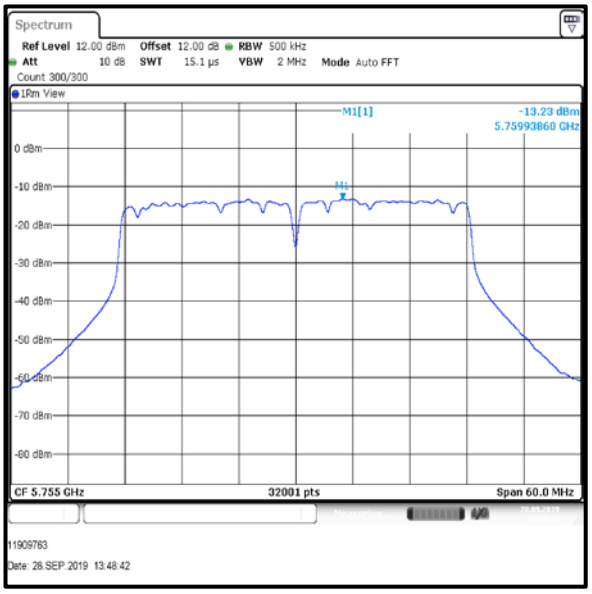
Channel	Port 3		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-11.1	0.4	-10.7
Top	-10.2	0.4	-9.8

Channel	Corrected PPSD Port 1 (dBm /500k Hz)	Corrected PPSD Port 2 (dBm /500k Hz)	Corrected PPSD Port 3 (dBm /500k Hz)	Combined PPSD (dBm /500k Hz)	Limit (dBm/500k Hz)	Margin (dB)	Result
Bottom	-12.8	-11.1	-10.7	-6.7	17.0	23.7	Complied
Top	-13.2	-10.9	-9.8	-6.3	17.0	23.3	Complied

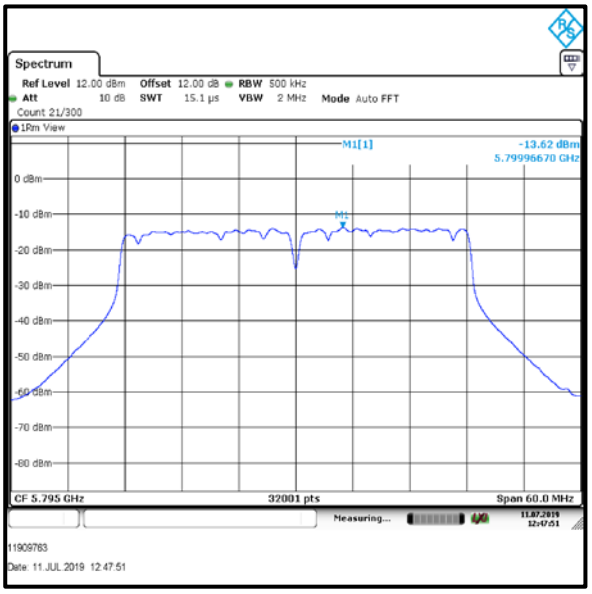
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 1 / PWL 12 / 23 dBi Antenna Group

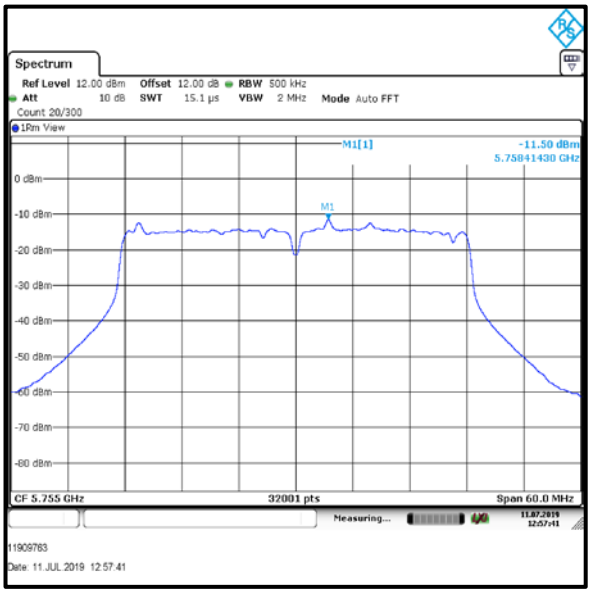


Bottom Channel

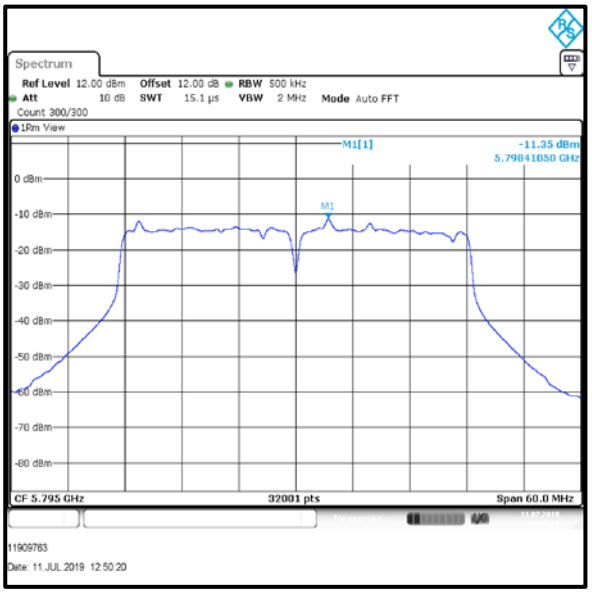


Top Channel

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 2 / PWL 12 / 23 dBi Antenna Group



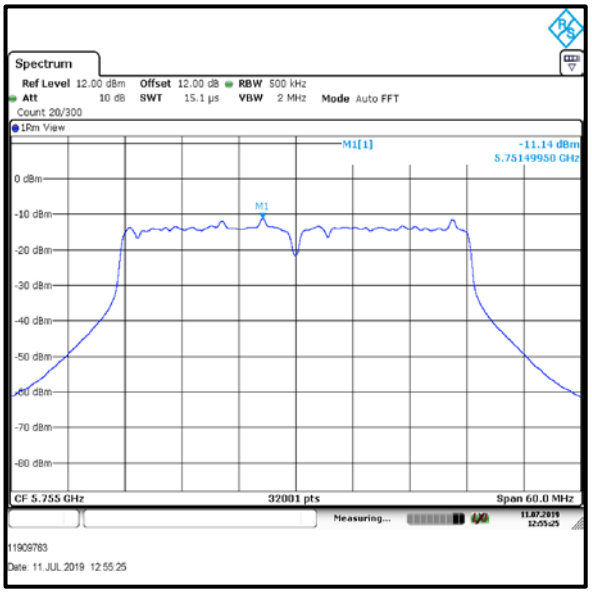
Bottom Channel



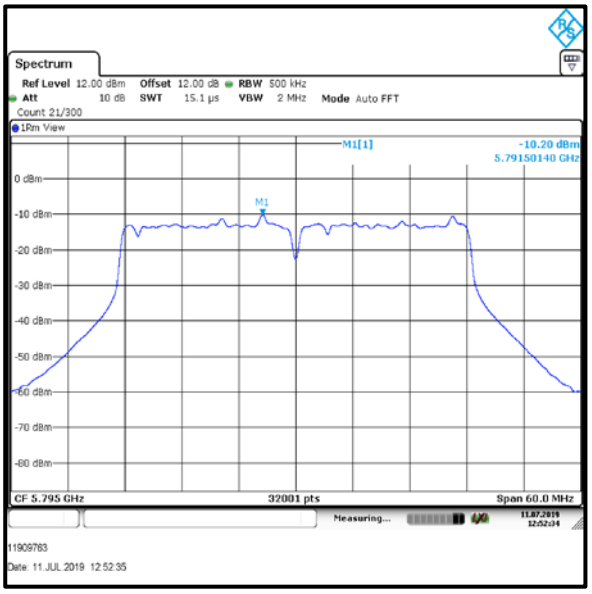
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 3 / PWL 12 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT80 / MCS0 / MIMO / Port 1+2+3 / PWL 12 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Single	-15.2	0.5	-14.7	-16.2	0.5	-15.7

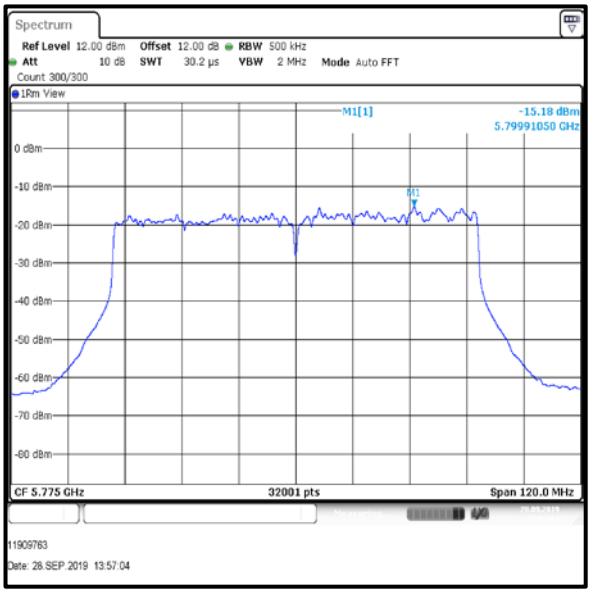
Channel	Port 3		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Single	-17.2	0.5	-16.7

Channel	Corrected PPSD Port 1 (dBm /500kHz)	Corrected PPSD Port 2 (dBm /500k Hz)	Corrected PPSD Port 3 (dBm /500k Hz)	Combined PPSD (dBm /500k Hz)	Limit (dBm/500k Hz)	Margin (dB)	Result
Single	-14.7	-15.7	-16.7	-10.9	17.0	27.9	Complied

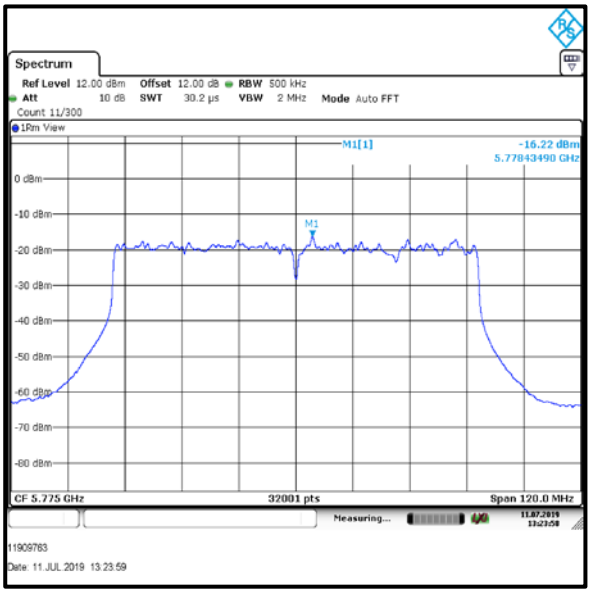
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

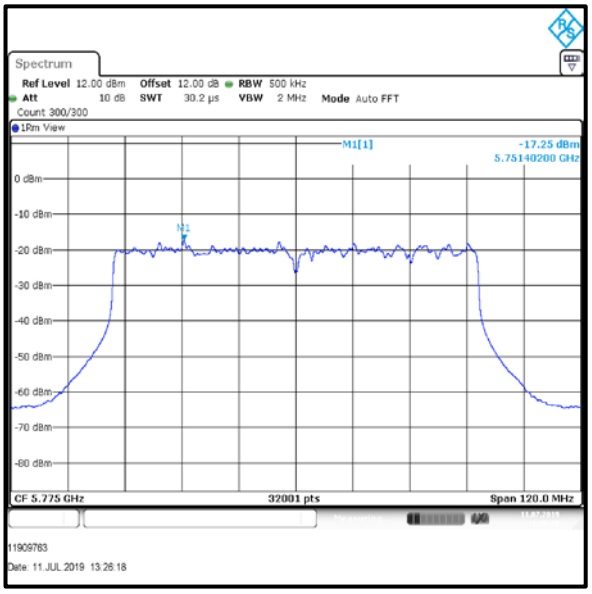
Results: 802.11ac / HT80 / MCS0 / MIMO / Port 1+2+3 / PWL 12 / 23 dBi Antenna Group



Single Channel Port 1



Single Channel Port 2



Single Channel Port 3

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 1+2+3+4 /PWL 16/ 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)
Bottom +1	-5.9	0.3	-5.6	-6.3	0.3	-6.0
Middle	-5.8	0.3	-5.5	-6.3	0.3	-6.0
Top -1	-5.9	0.3	-5.6	-5.9	0.3	-5.6

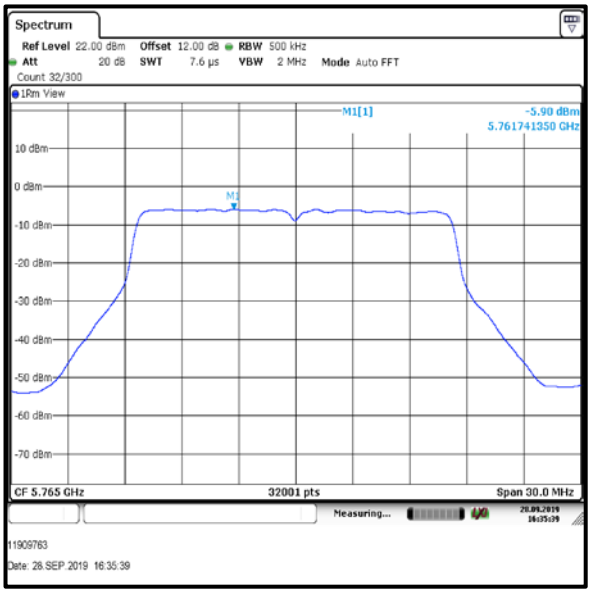
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom +1	-6.0	0.3	-5.7	-6.7	0.3	-6.4
Middle	-5.8	0.3	-5.5	-6.5	0.3	-6.2
Top -1	-6.2	0.3	-5.9	-6.7	0.3	-6.4

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom +1	-5.6	-6.0	-5.7	-6.4	0.1	15.7	15.6	Complied
Middle	-5.5	-6.0	-5.5	-6.2	0.2	15.7	15.5	Complied
Top -1	-5.6	-5.6	-5.9	-6.4	0.2	15.7	15.5	Complied

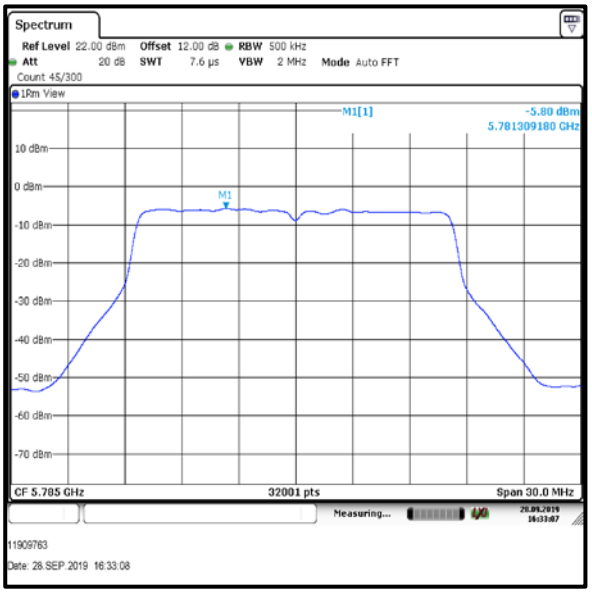
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

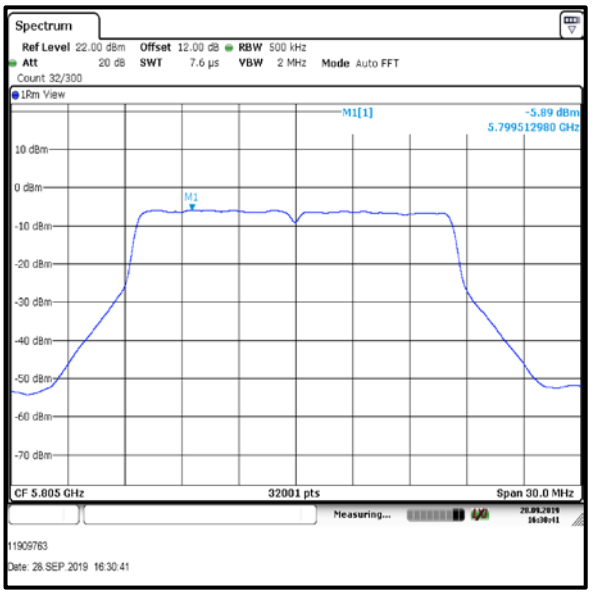
Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 1 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



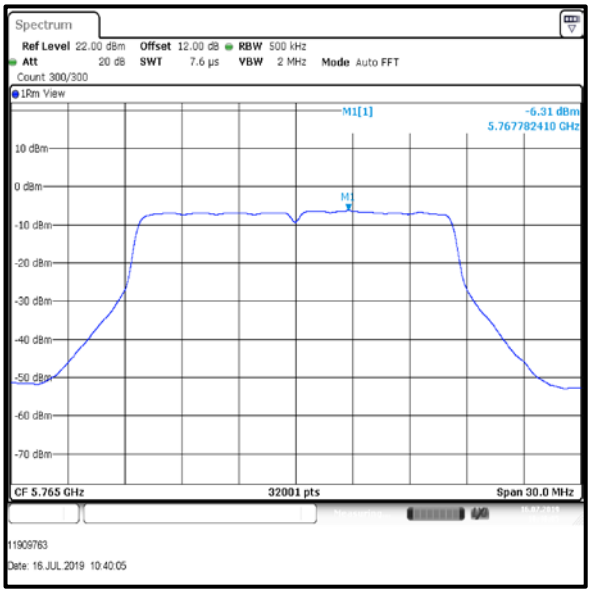
Middle Channel



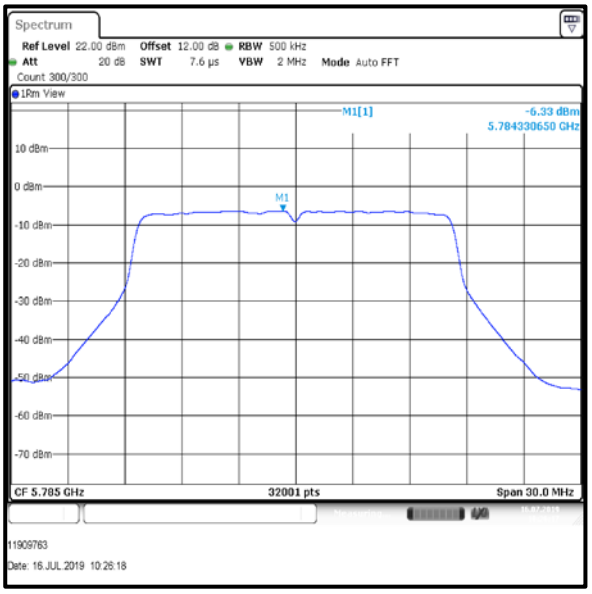
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

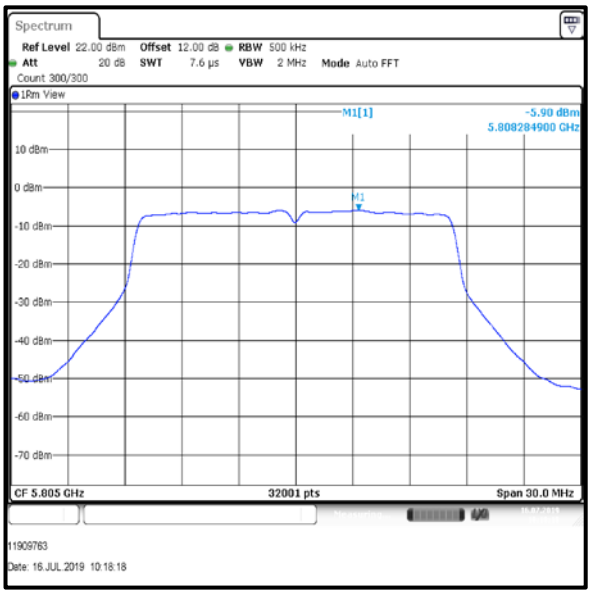
Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 2 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



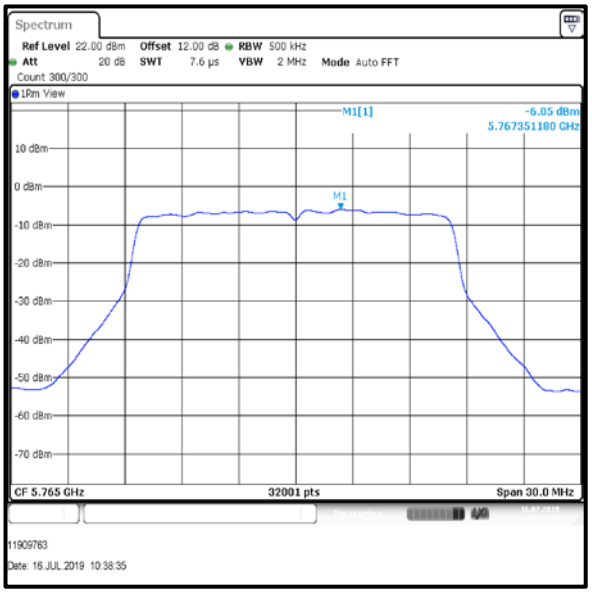
Middle Channel



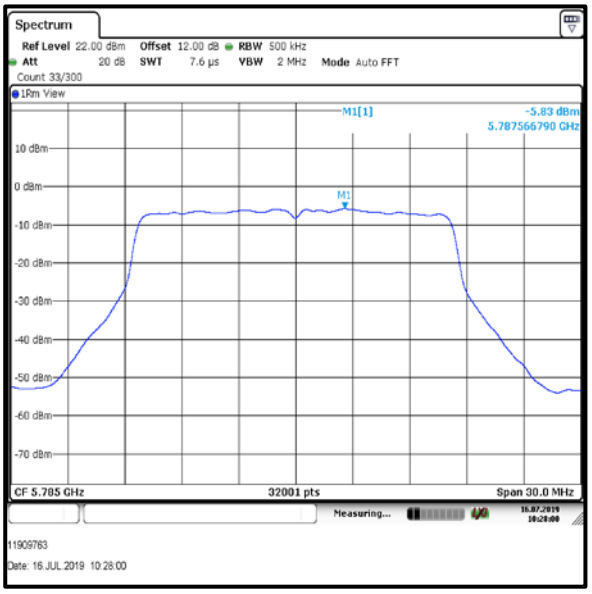
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

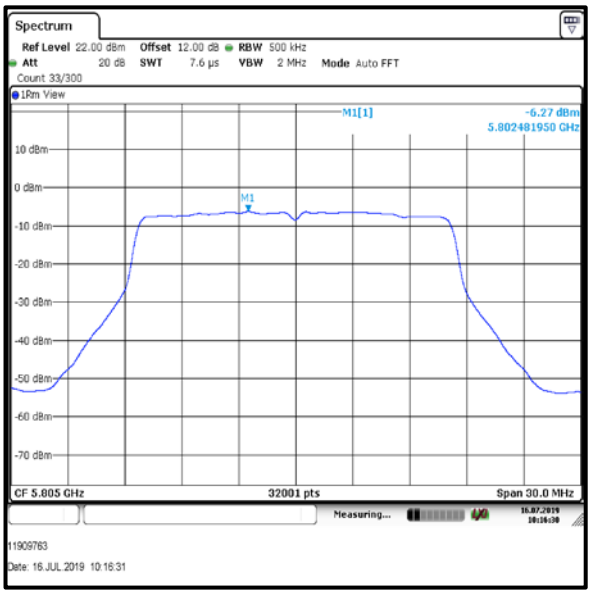
Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 3 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



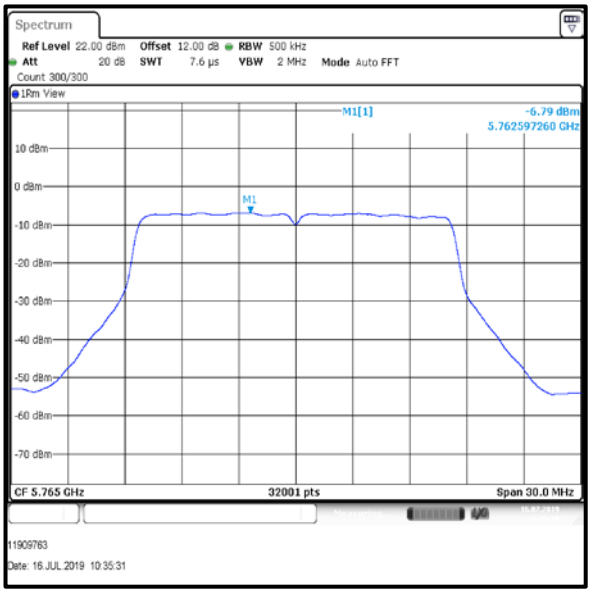
Middle Channel



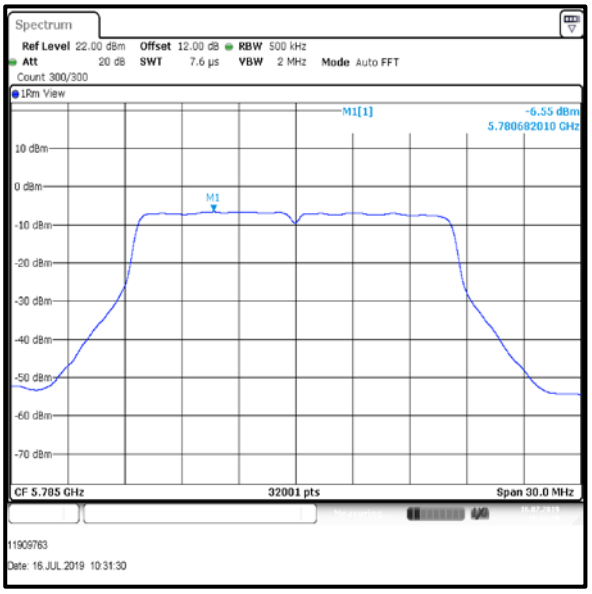
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

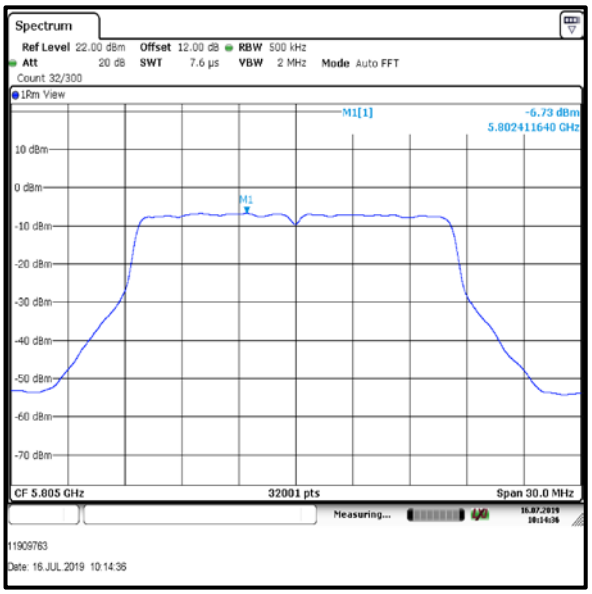
Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 4 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



Middle Channel



Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 1+2+3+4 /PWL 11/ 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)
Bottom	-11.0	0.3	-10.7	-10.9	0.3	-10.6
Top	-11.0	0.3	-10.7	-8.8	0.3	-8.5

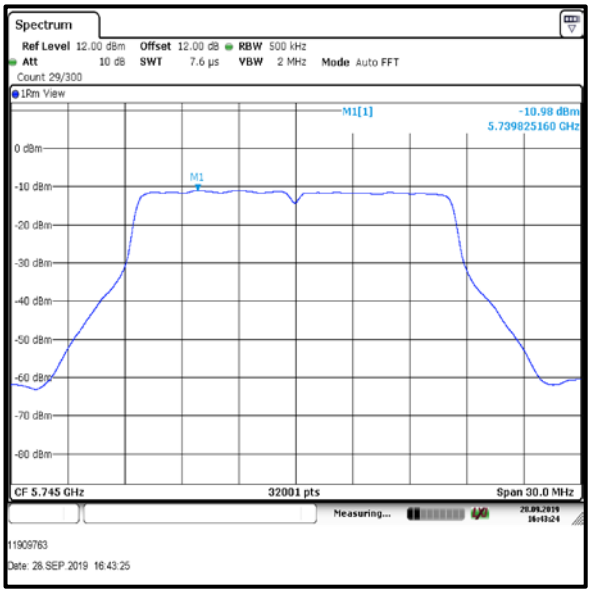
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom	-9.8	0.3	-9.5	-10.6	0.3	-10.3
Top	-9.7	0.3	-9.4	-11.2	0.3	-10.9

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom	-10.7	-10.6	-9.5	-10.3	-4.2	15.7	19.9	Complied
Top	-10.7	-8.5	-9.4	-10.9	-3.7	15.7	19.4	Complied

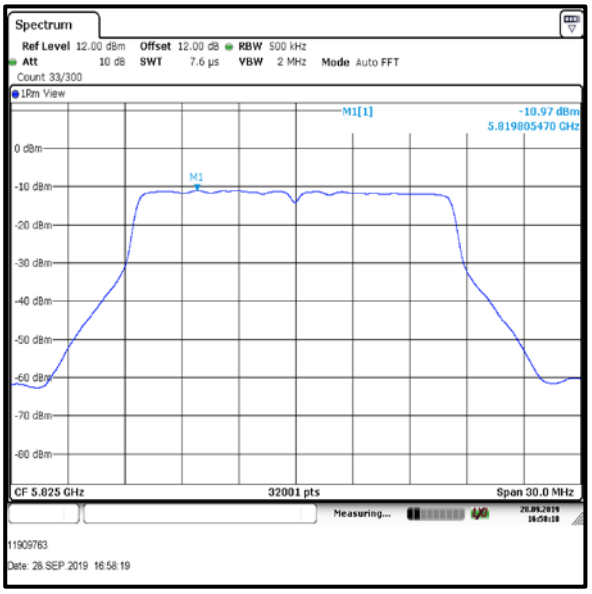
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 1 / PWL 11 / 23 dBi Antenna Group

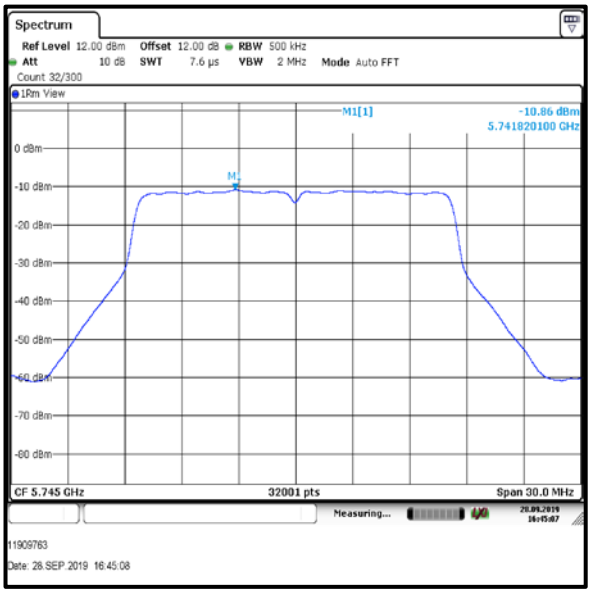


Bottom Channel

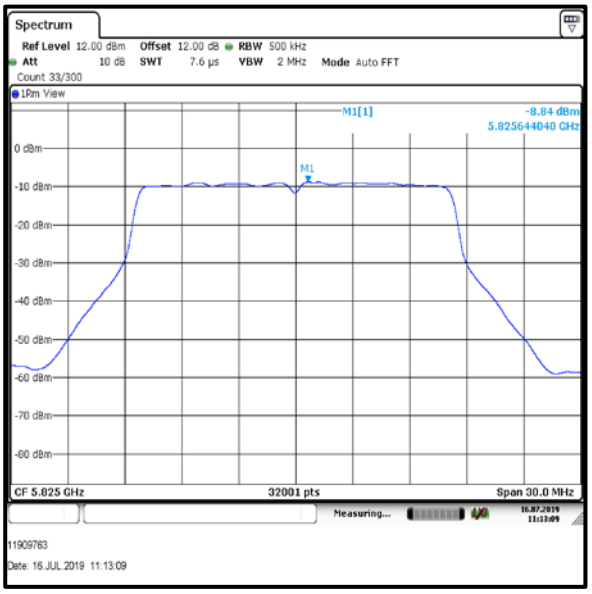


Top Channel

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 2 / PWL 11 / 23 dBi Antenna Group



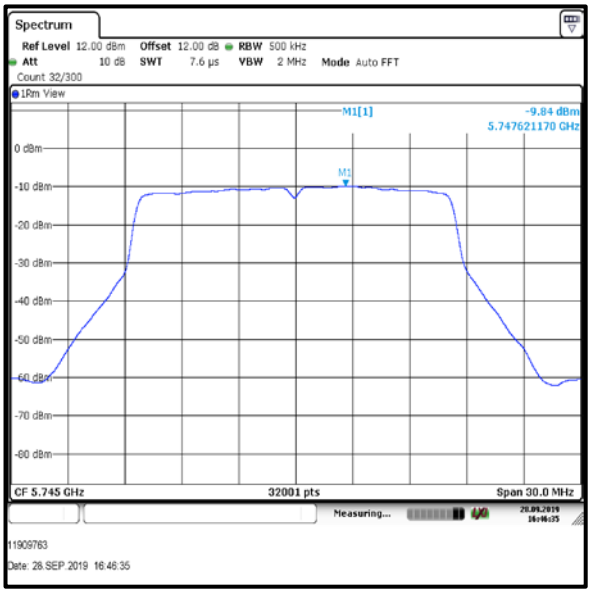
Bottom Channel



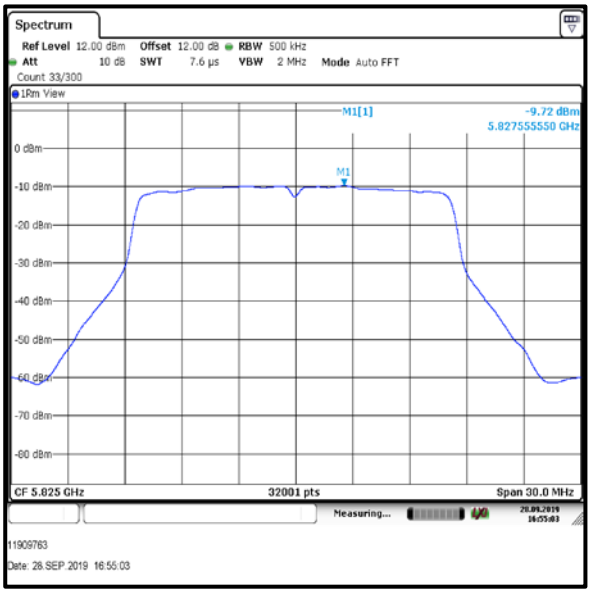
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 3 / PWL 11 / 23 dBi Antenna Group

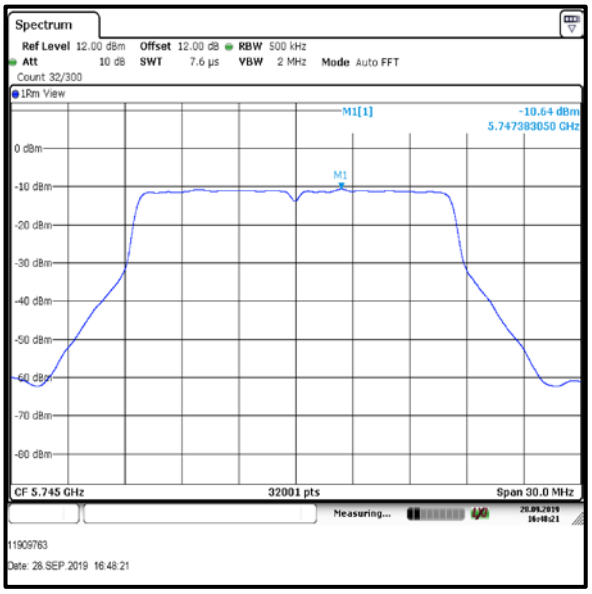


Bottom Channel

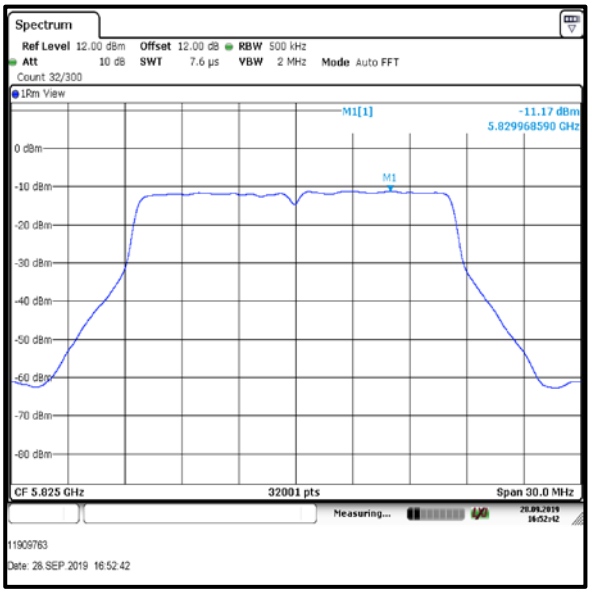


Top Channel

Results: 802.11a / 20 MHz / 6 Mbps / MIMO / Port 4 / PWL 11 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1+2+3+4 / PWL 16 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)
Bottom +1	-6.3	0.5	-5.8	-6.8	0.5	-6.3
Middle	-6.3	0.5	-5.8	-6.8	0.5	-6.3
Top -1	-6.5	0.5	-6.0	-6.5	0.5	-6.0

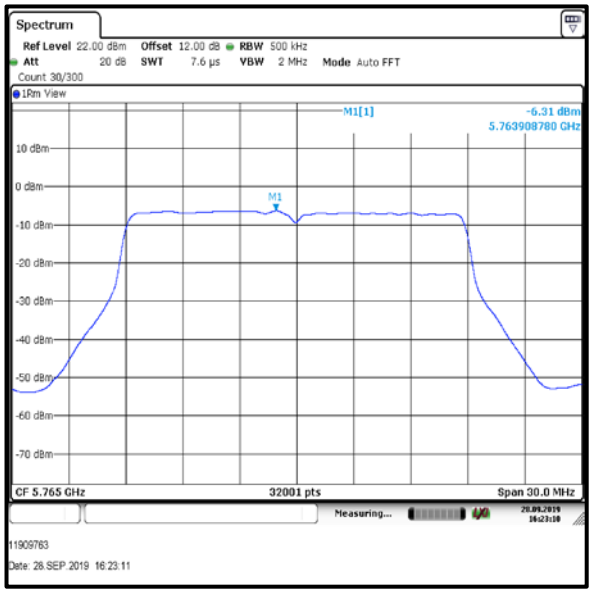
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom +1	-6.3	0.5	-5.8	-6.8	0.5	-6.3
Middle	-6.8	0.5	-6.3	-7.0	0.5	-6.5
Top -1	-6.5	0.5	-6.0	-7.0	0.5	-6.5

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom +1	-5.8	-6.3	-5.8	-6.3	0.0	15.7	15.7	Complied
Middle	-5.8	-6.3	-6.3	-6.5	-0.2	15.7	15.9	Complied
Top -1	-6.0	-6.0	-6.0	-6.5	-0.1	15.7	15.8	Complied

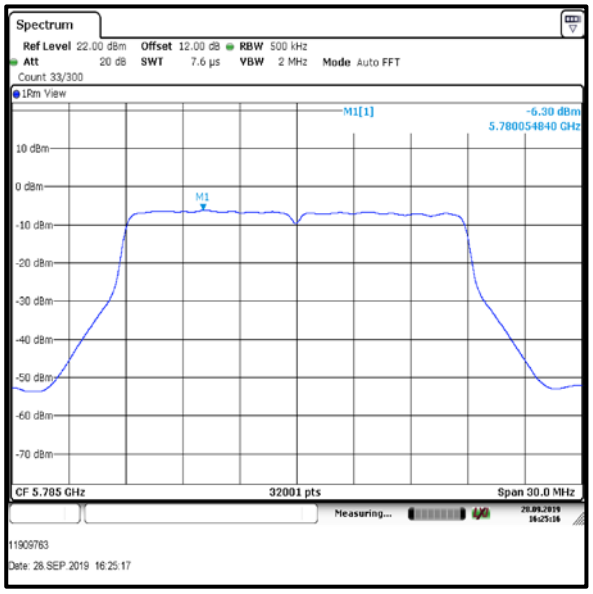
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

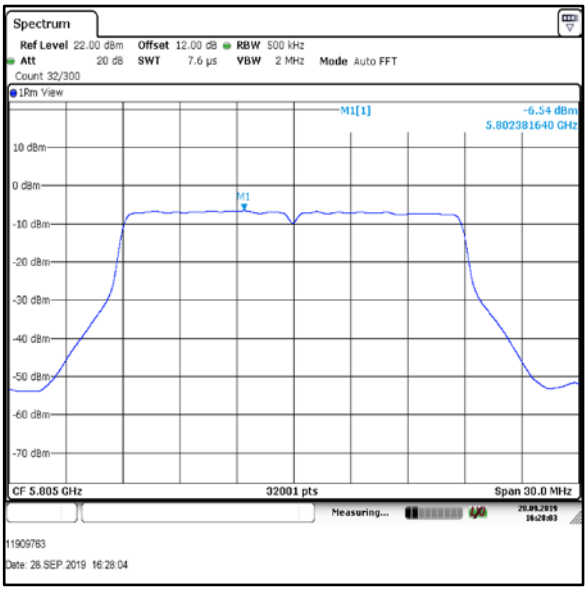
Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



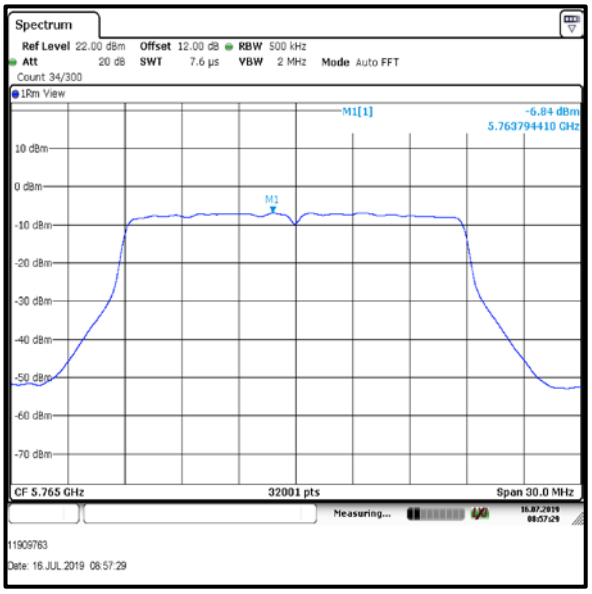
Middle Channel



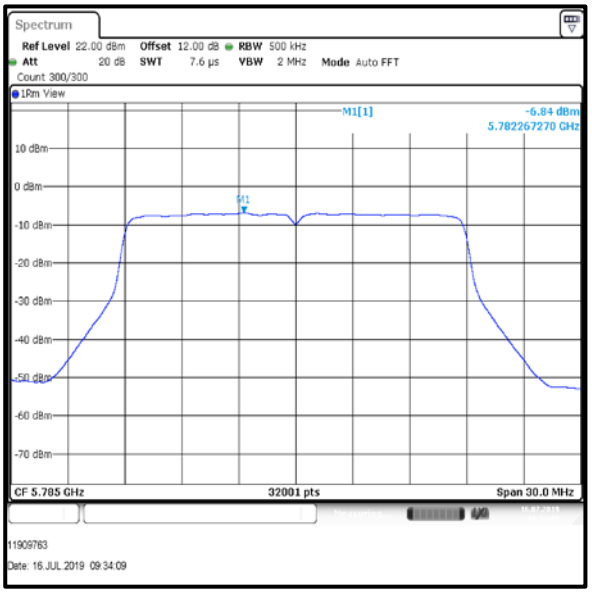
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

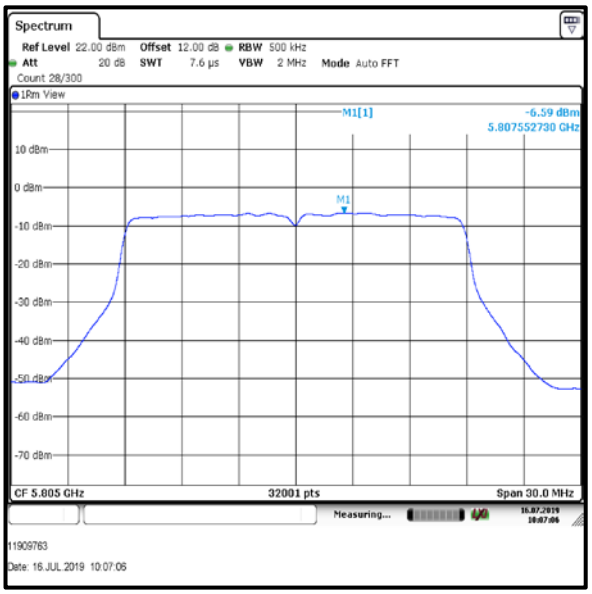
Results: 802.11n / 20 MHz / MCS0/ MIMO / Port 2 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



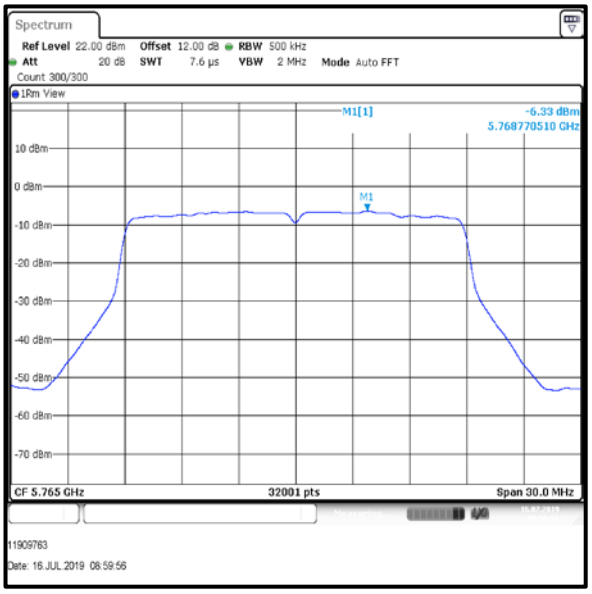
Middle Channel



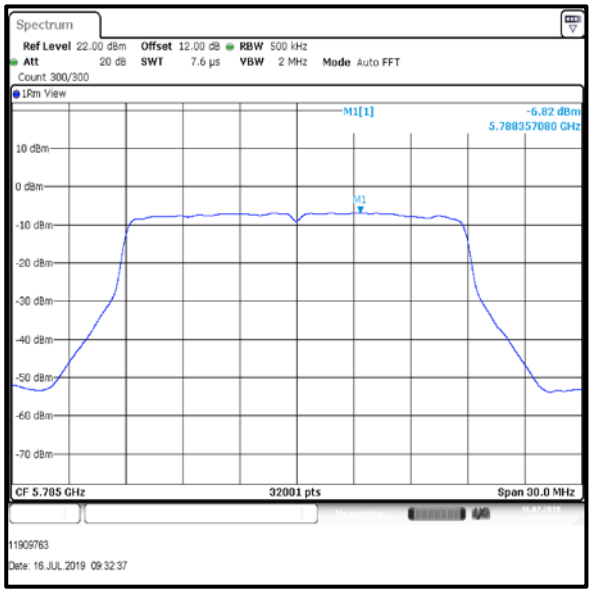
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

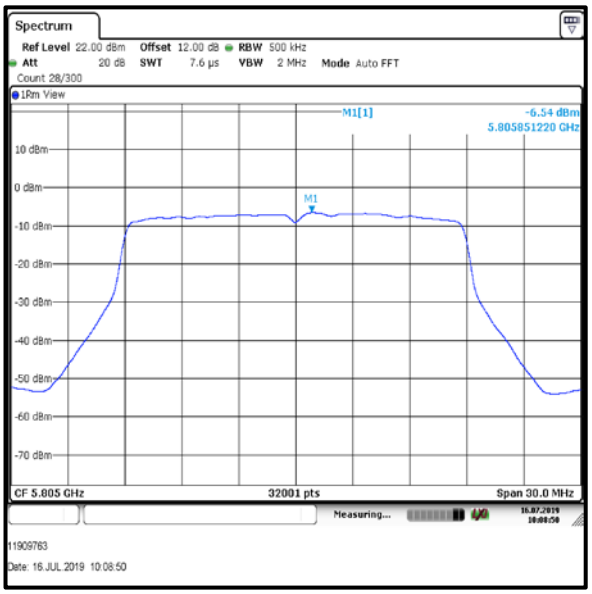
Results: 802.11n / 20 MHz / MCS0/ MIMO / Port 3 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



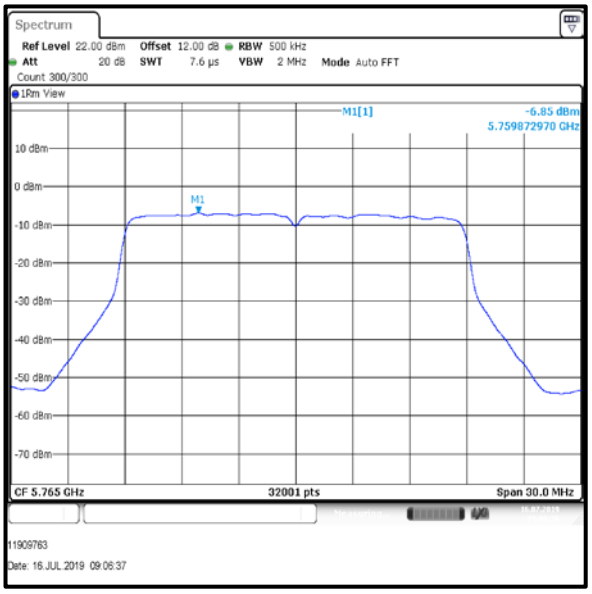
Middle Channel



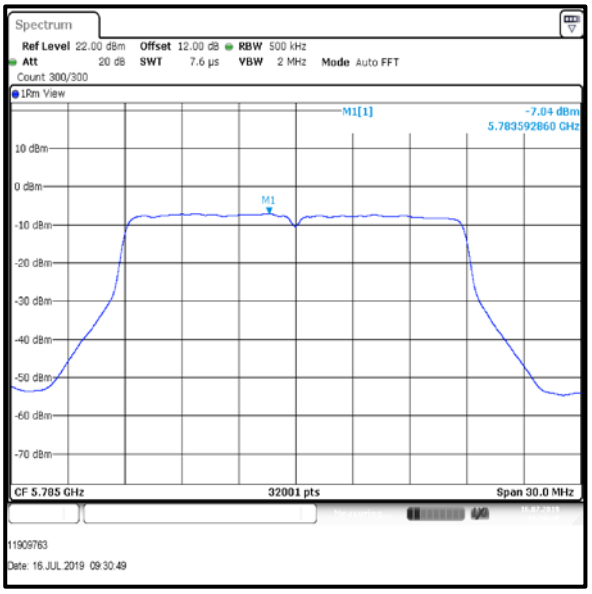
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

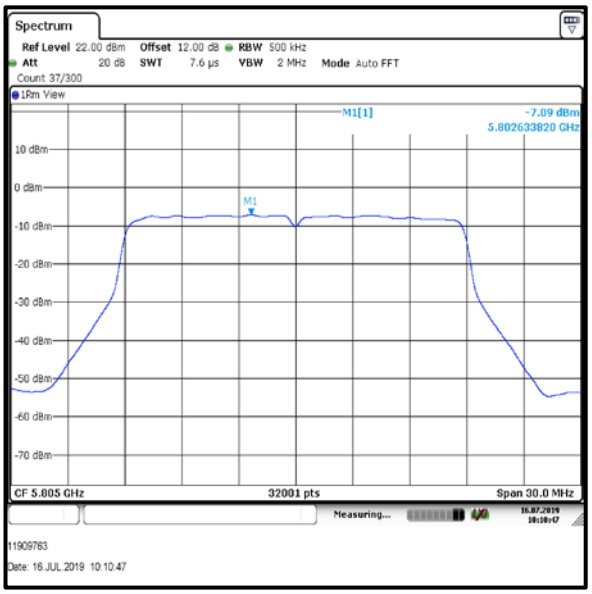
Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 4 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



Middle Channel



Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1+2+3+4 / PWL 11 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-11.5	0.5	-11.0	-11.3	0.5	-10.8
Top	-11.7	0.5	-11.2	-9.9	0.5	-9.4

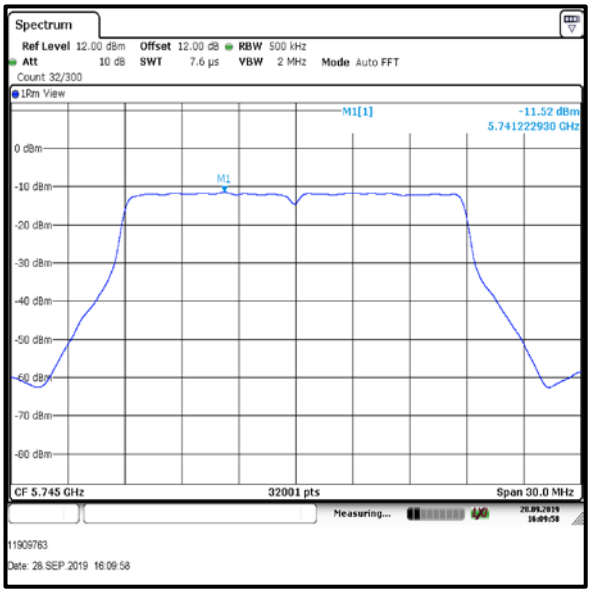
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom	-10.1	0.5	-9.6	-11.1	0.5	-10.6
Top	-10.1	0.5	-9.6	-11.5	0.5	-11.0

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom	-11.0	-10.8	-9.6	-10.6	-4.4	15.7	20.1	Complied
Top	-11.2	-9.4	-9.6	-11.0	-4.2	15.7	19.9	Complied

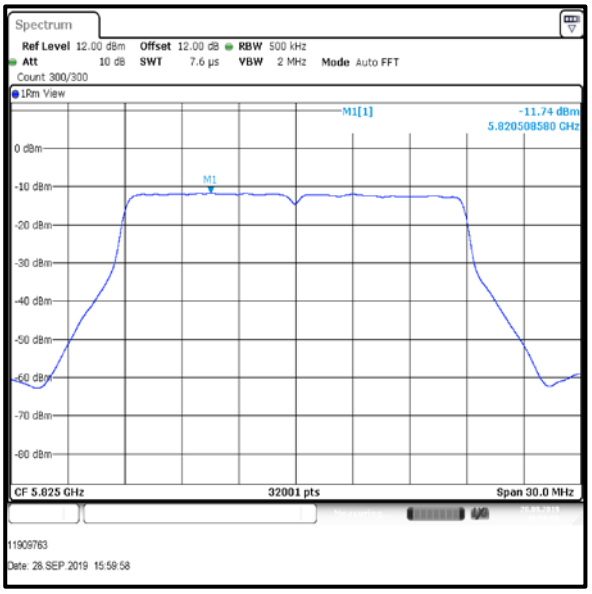
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 1 / PWL 11 / 23 dBi Antenna Group

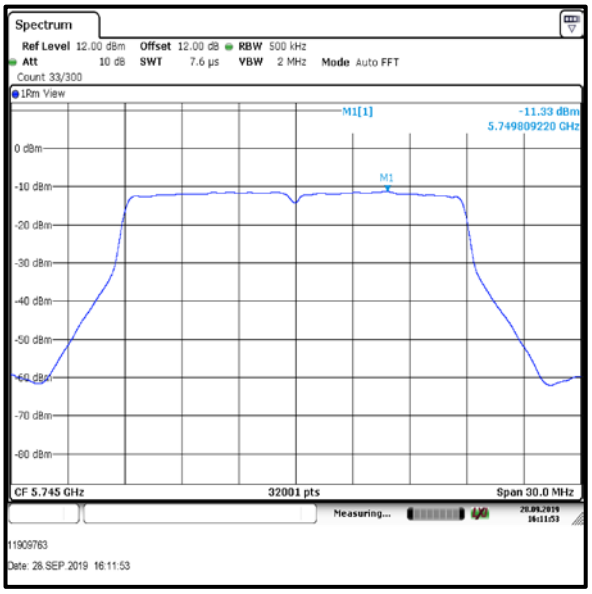


Bottom Channel

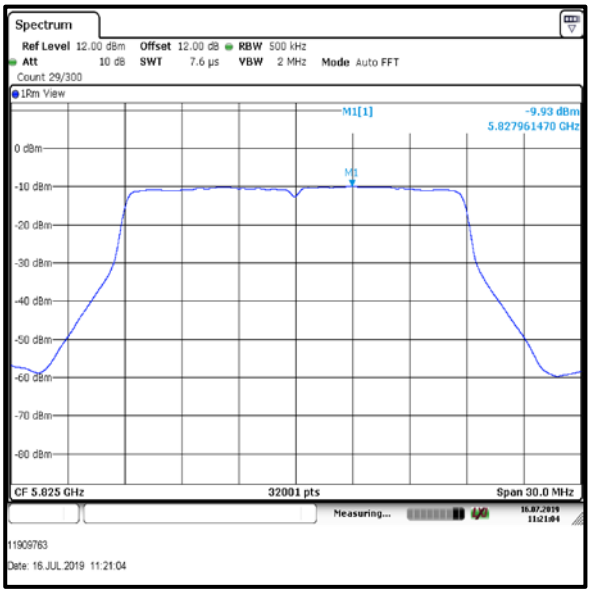


Top Channel

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 2 / PWL 11 / 23 dBi Antenna Group



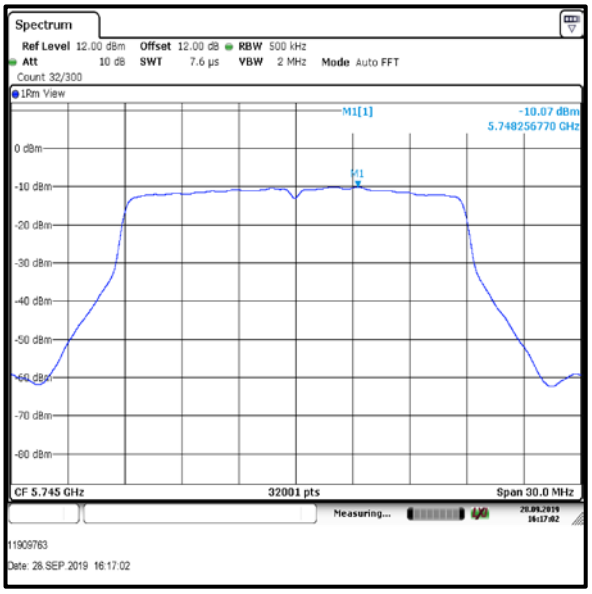
Bottom Channel



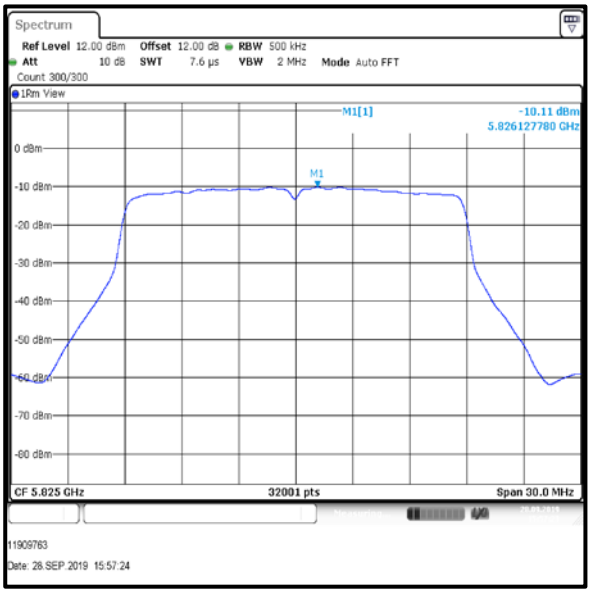
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 3 / PWL 11 / 23 dBi Antenna Group

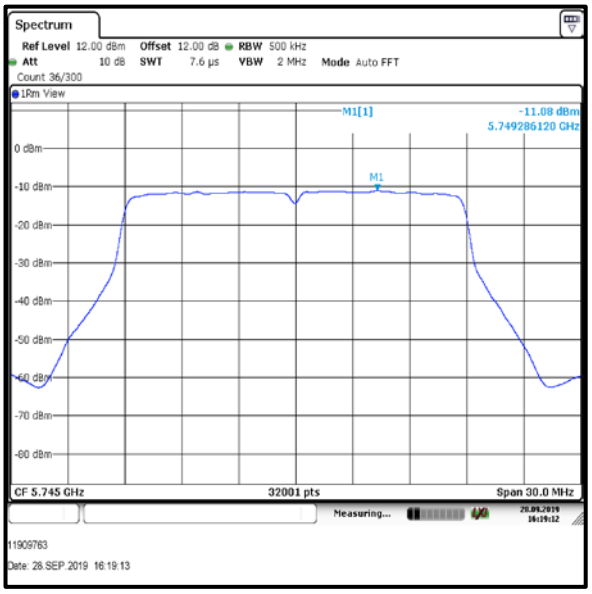


Bottom Channel

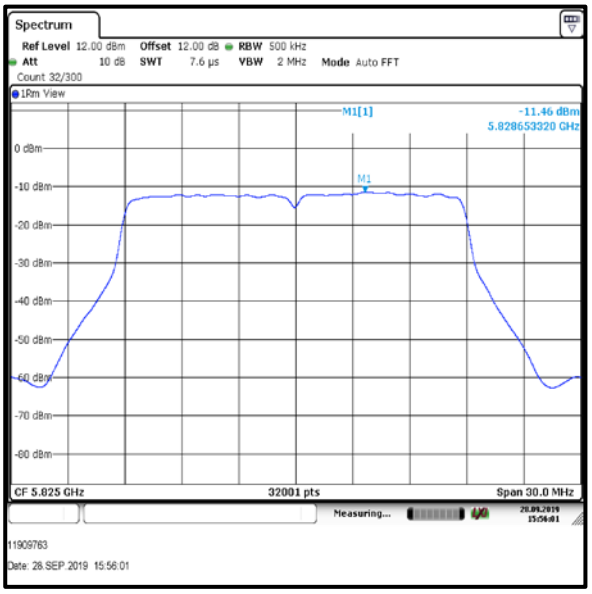


Top Channel

Results: 802.11n / 20 MHz / MCS0 / MIMO / Port 4 / PWL 11 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1+2+3+4 / PWL 16/ 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)	PPSD (dBm/500 kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm/500 kHz)
Bottom +1	-5.4	0.4	-5.0	-6.2	0.4	-5.8
Middle	-5.7	0.4	-5.3	-6.1	0.4	-5.7
Top -1	-5.9	0.4	-5.5	-6.0	0.4	-5.6

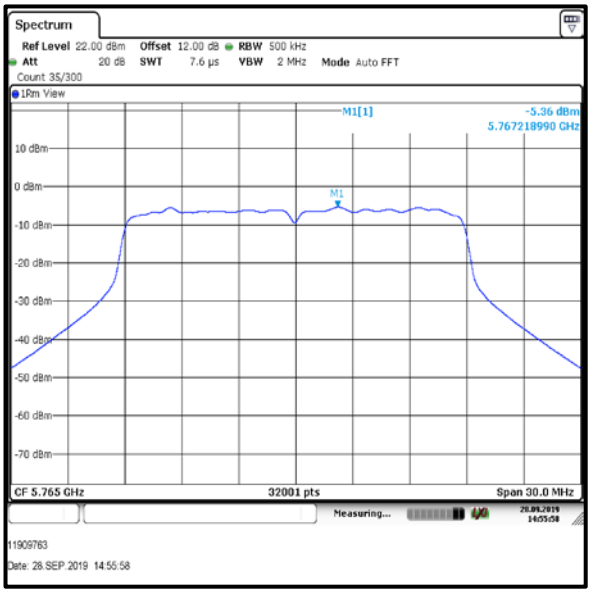
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom +1	-6.2	0.4	-5.8	-7.0	0.4	-6.6
Middle	-6.5	0.4	-6.1	-6.8	0.4	-6.4
Top -1	-6.8	0.4	-6.4	-6.9	0.4	-6.5

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom +1	-5.0	-5.8	-5.8	-6.6	0.3	15.7	15.4	Complied
Middle	-5.3	-5.7	-6.1	-6.4	0.2	15.7	15.5	Complied
Top -1	-5.5	-5.6	-6.4	-6.5	0.0	15.7	15.7	Complied

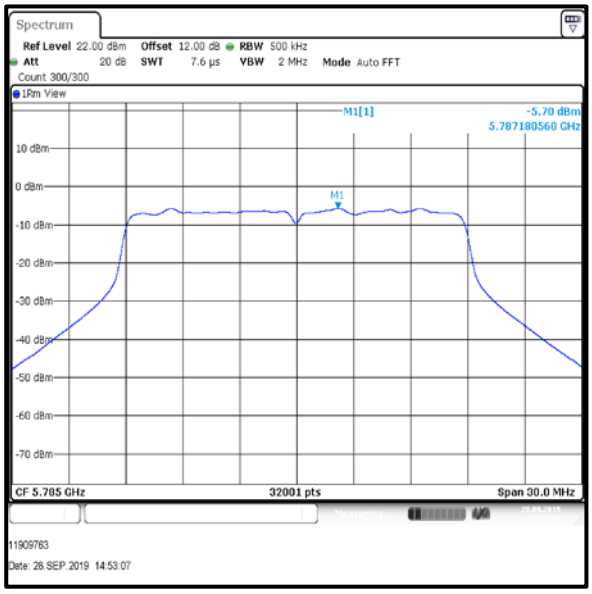
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

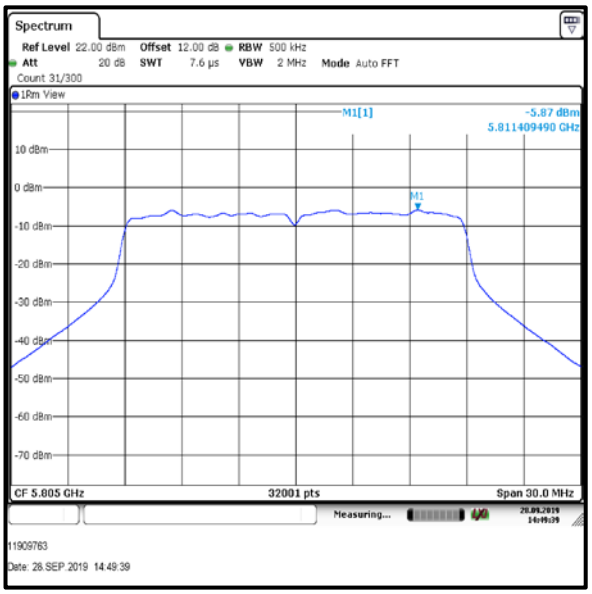
Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



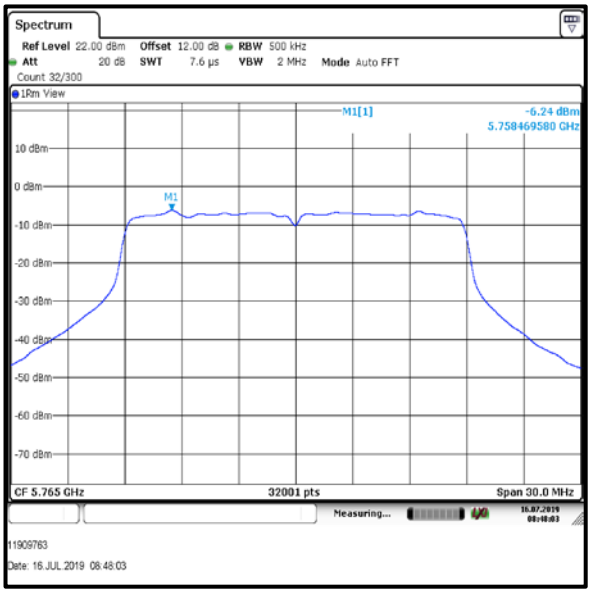
Middle Channel



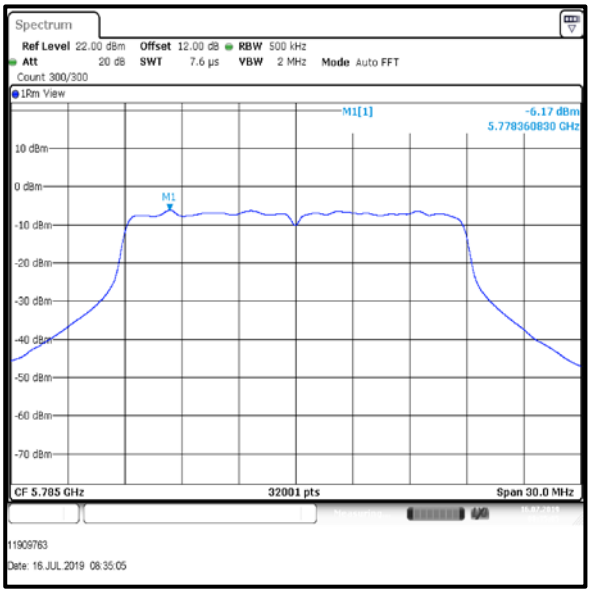
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

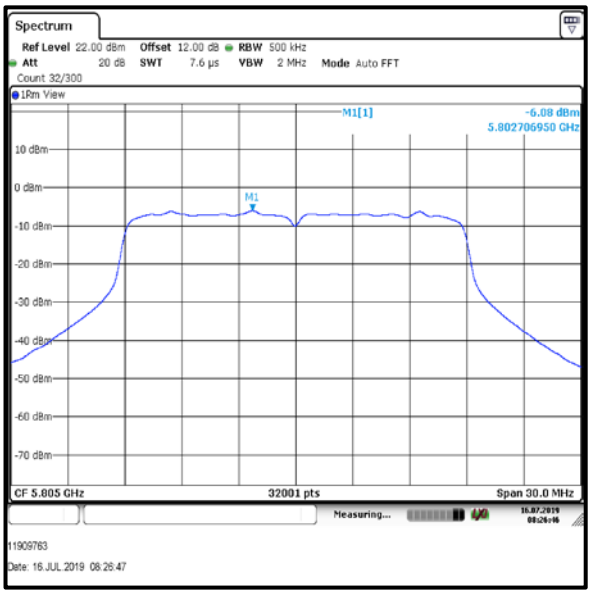
Results: 802.11ac / 20 MHz / MCS0/ MIMO / Port 2 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



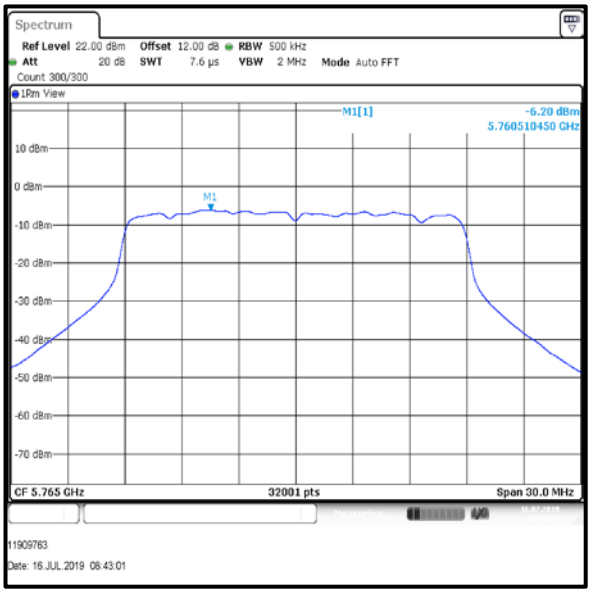
Middle Channel



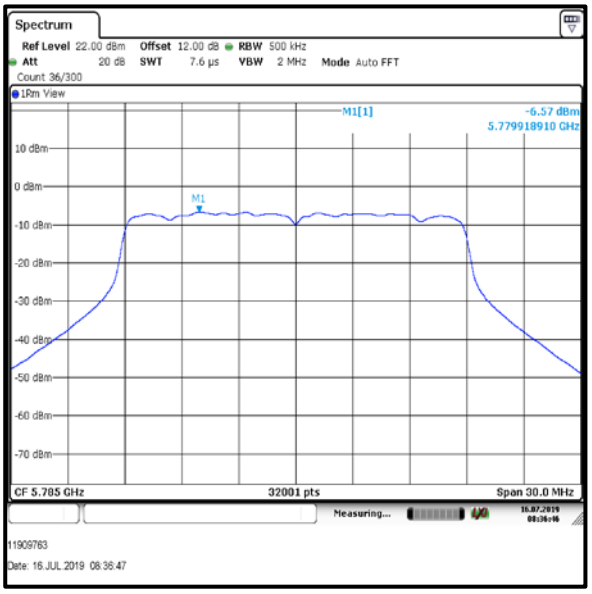
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

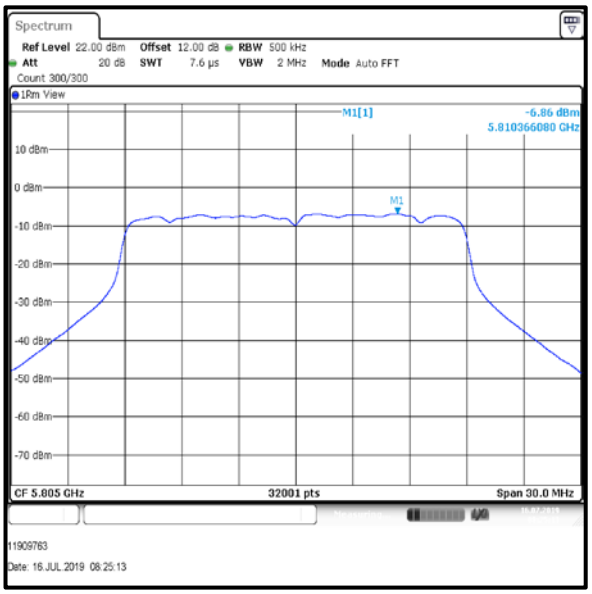
Results: 802.11ac / 20 MHz / MCS0/ MIMO / Port 3 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



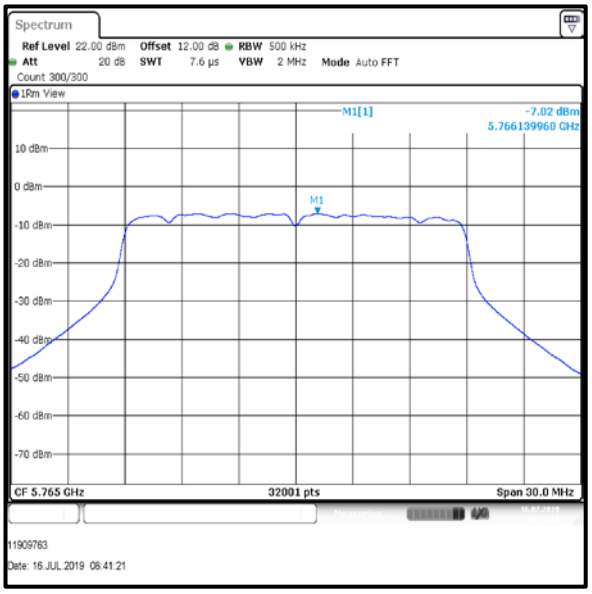
Middle Channel



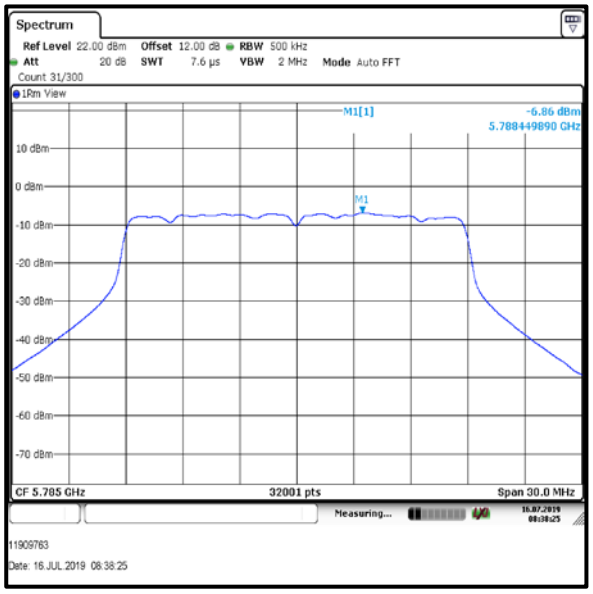
Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

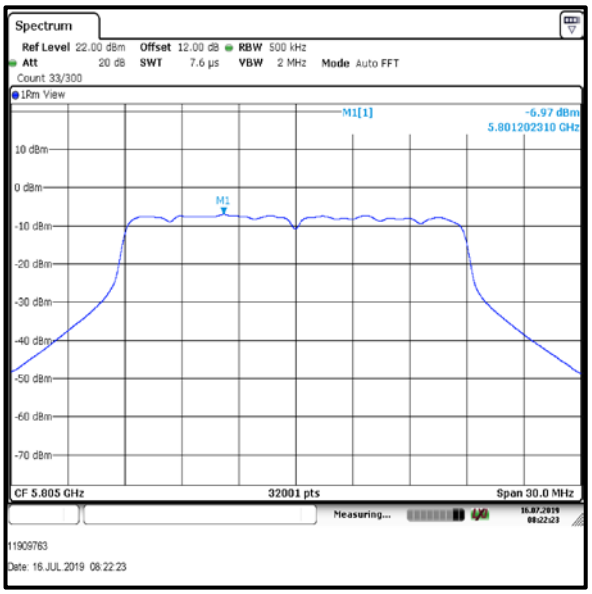
Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 4 / PWL 16 / 23 dBi Antenna Group



Bottom +1 Channel



Middle Channel



Top -1 Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1+2+3+4 / PWL 11/ 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-10.6	0.4	-10.2	-11.0	0.4	-10.6
Top	-10.2	0.4	-9.8	-8.7	0.4	-8.3

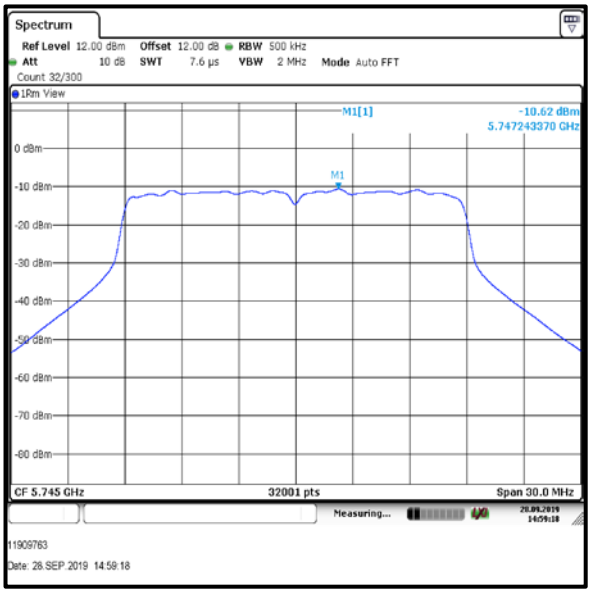
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom	-10.9	0.4	-10.5	-10.7	0.4	-10.3
Top	-10.4	0.4	-10.0	-11.5	0.4	-11.1

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom	-10.2	-10.6	-10.5	-10.3	-4.4	15.7	20.1	Complied
Top	-9.8	-8.3	-10.0	-11.1	-3.7	15.7	19.4	Complied

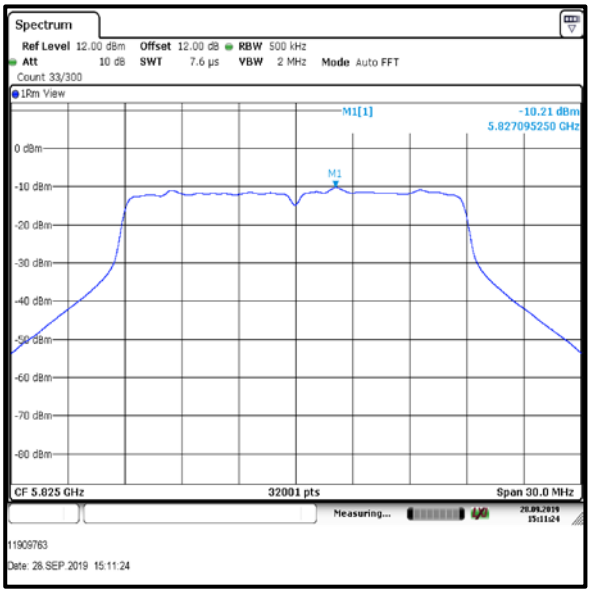
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 1 / PWL 11 / 23 dBi Antenna Group

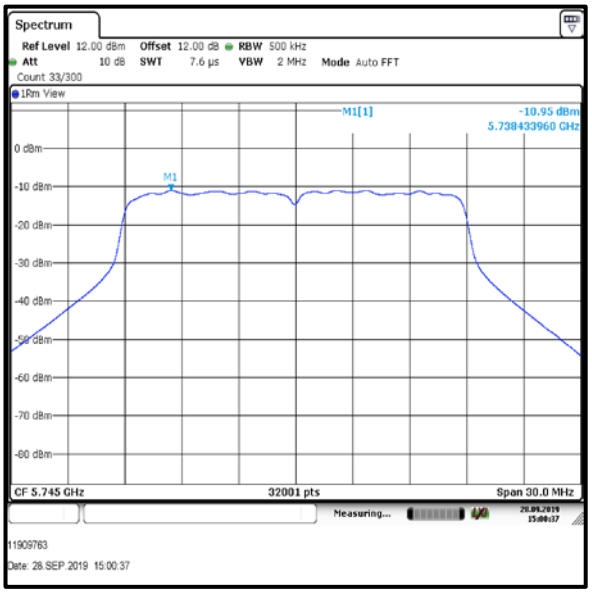


Bottom Channel

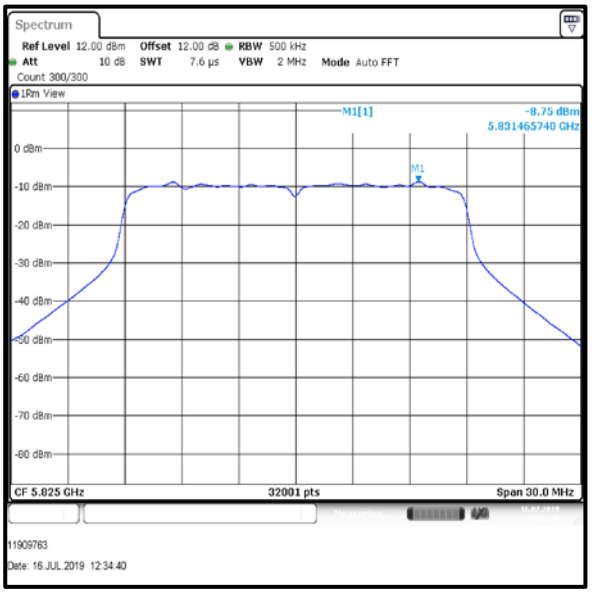


Top Channel

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 2 / PWL 11 / 23 dBi Antenna Group



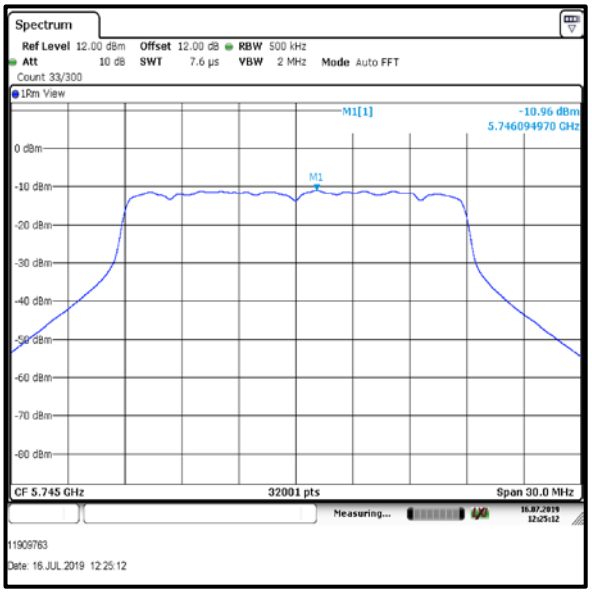
Bottom Channel



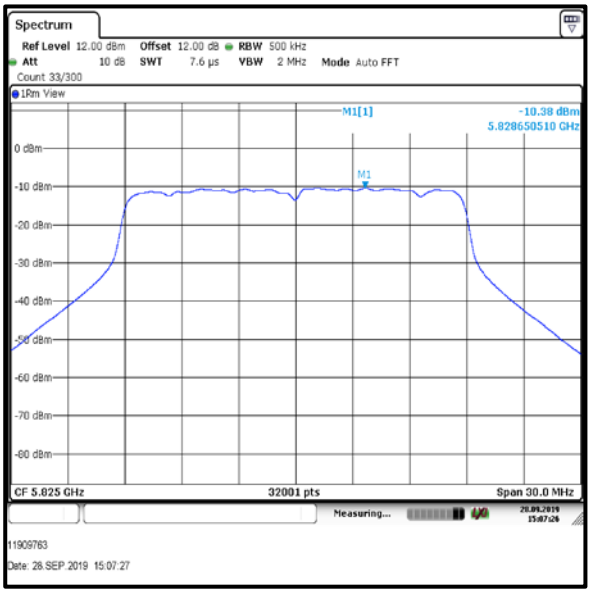
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 3 / PWL 11 / 23 dBi Antenna Group

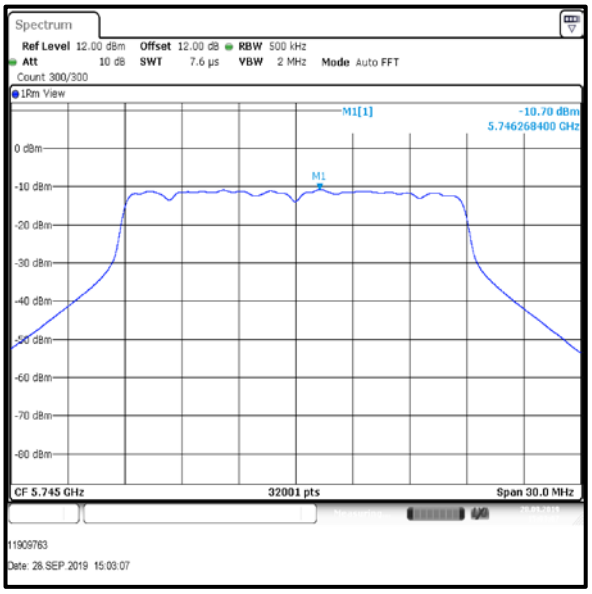


Bottom Channel

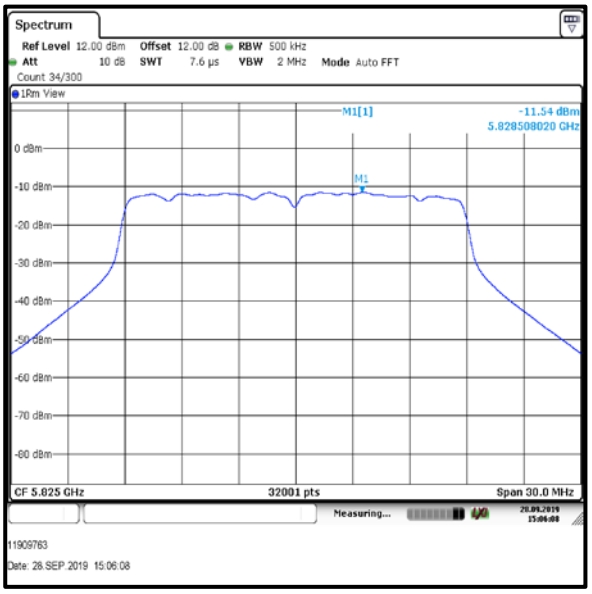


Top Channel

Results: 802.11ac / 20 MHz / MCS0 / MIMO / Port 4 / PWL 11 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 1+2+3+4 / PWL 11 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-14.1	0.4	-13.7	-14.5	0.4	-14.1
Top	-14.7	0.4	-14.3	-14.7	0.4	-14.3

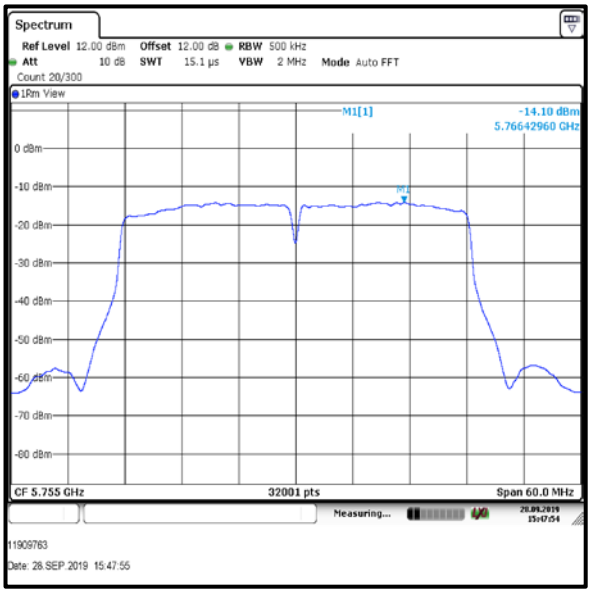
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom	-14.1	0.4	-13.7	-14.2	0.4	-13.8
Top	-14.4	0.4	-14.0	-14.1	0.4	-13.7

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom	-13.7	-14.1	-13.7	-13.8	-7.8	15.7	23.5	Complied
Top	-14.3	-14.3	-14.0	-13.7	-8.0	15.7	23.7	Complied

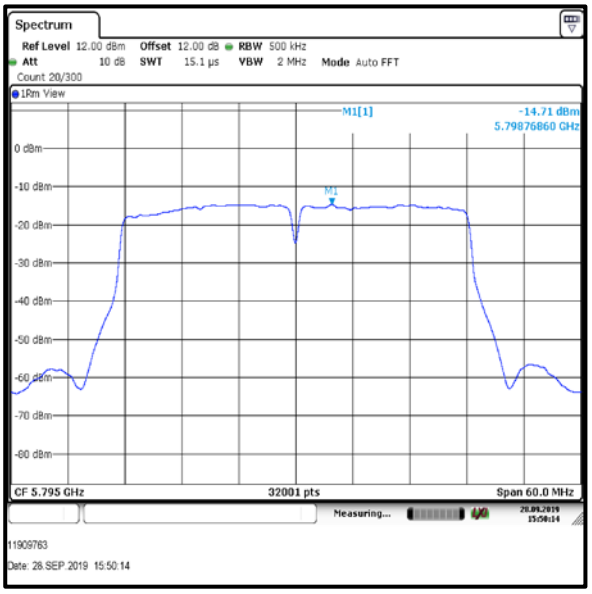
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 1 / PWL 11 / 23 dBi Antenna Group

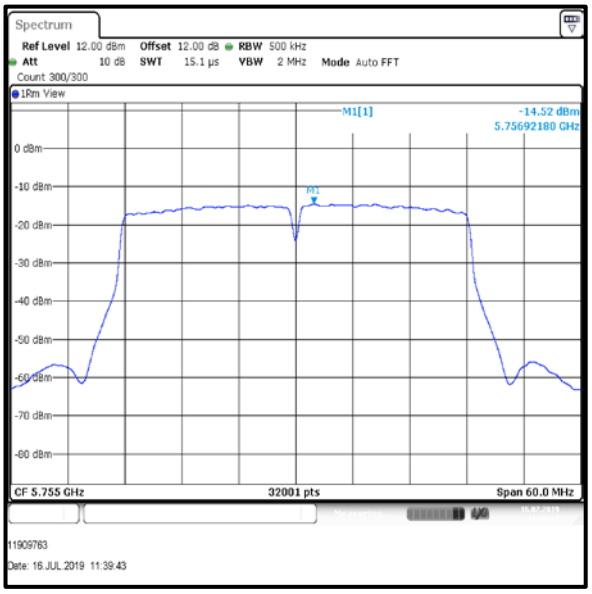


Bottom Channel

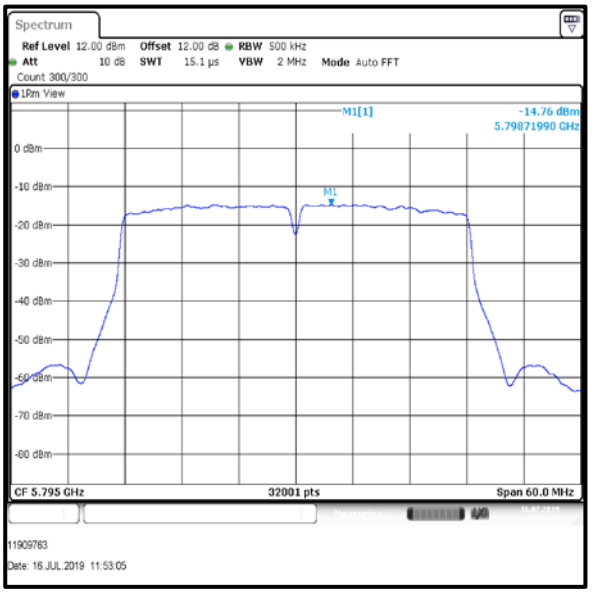


Top Channel

Results: 802.11n / HT40 / MCS0 / MIMO / Port 2 / PWL 11 / 23 dBi Antenna Group



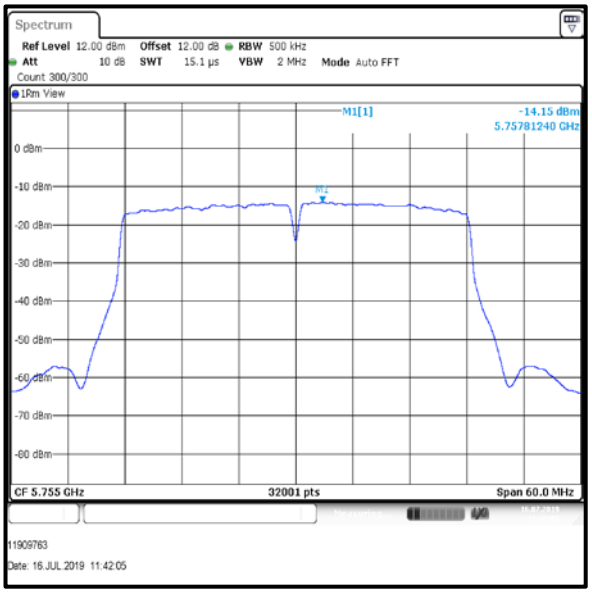
Bottom Channel



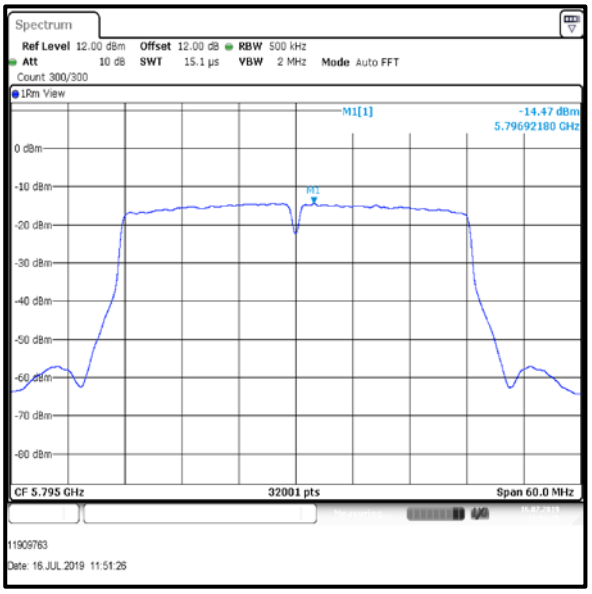
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11n / HT40 / MCS0 / MIMO / Port 3 / PWL 11 / 23 dBi Antenna Group

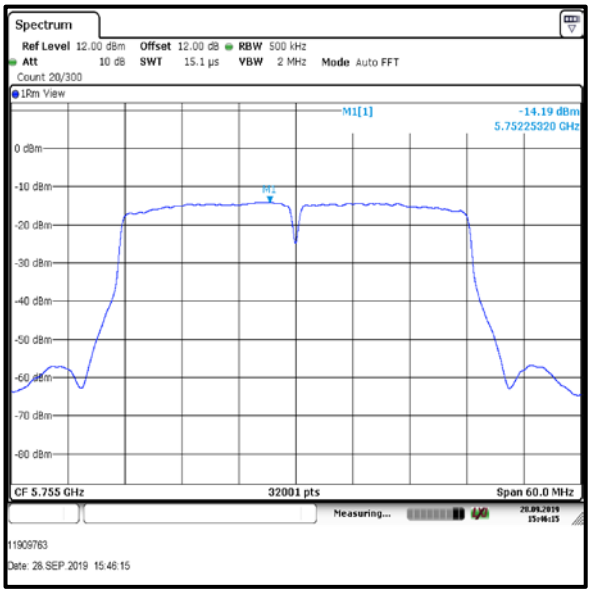


Bottom Channel

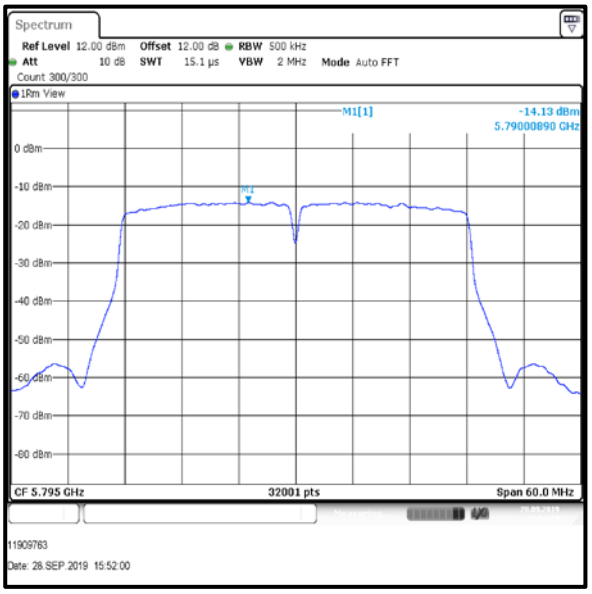


Top Channel

Results: 802.11n / HT40 / MCS0 / MIMO / Port 4 / PWL 11 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 1+2+3+4 / PWL 11 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Bottom	-14.9	0.4	-14.5	-15.3	0.4	-14.9
Top	-15.0	0.4	-14.6	-15.3	0.4	-14.9

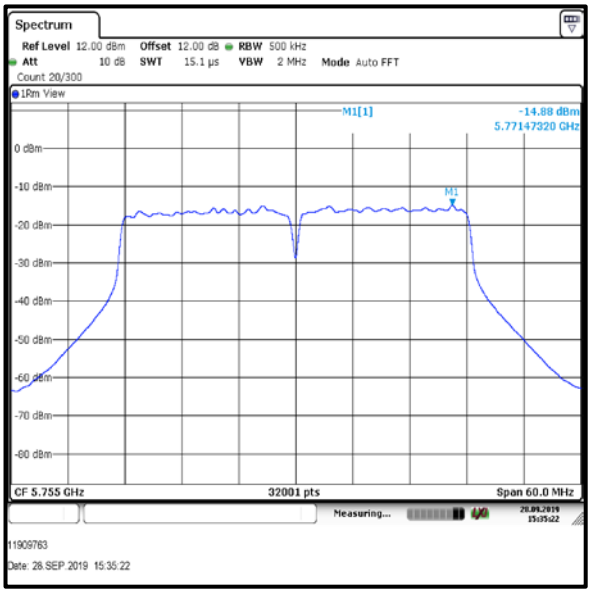
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Bottom	-15.5	0.4	-15.1	-15.5	0.4	-15.1
Top	-15.4	0.4	-15.0	-15.5	0.4	-15.1

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Bottom	-14.5	-14.9	-15.1	-15.1	-8.9	15.7	24.6	Complied
Top	-14.6	-14.9	-15.0	-15.1	-8.9	15.7	24.6	Complied

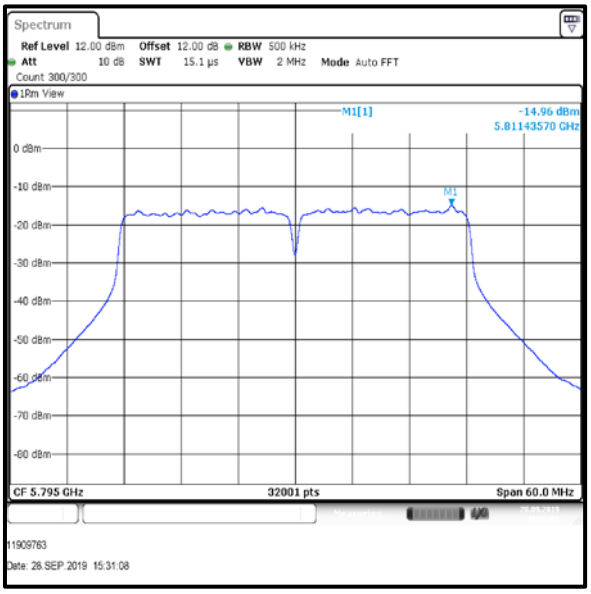
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 1 / PWL 11 / 23 dBi Antenna Group

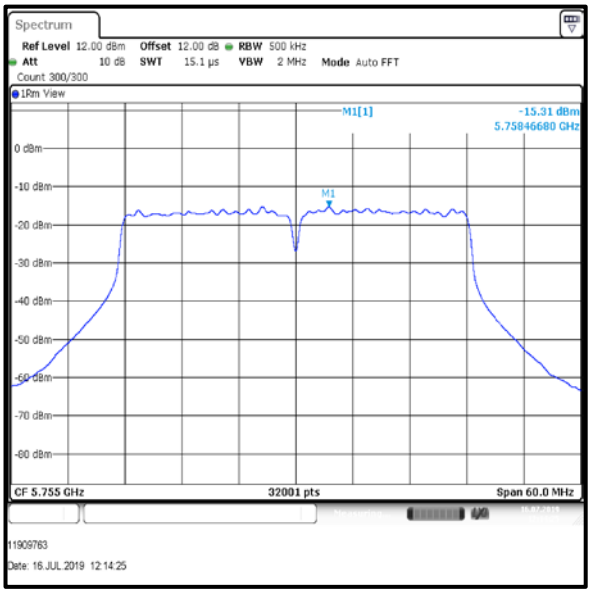


Bottom Channel

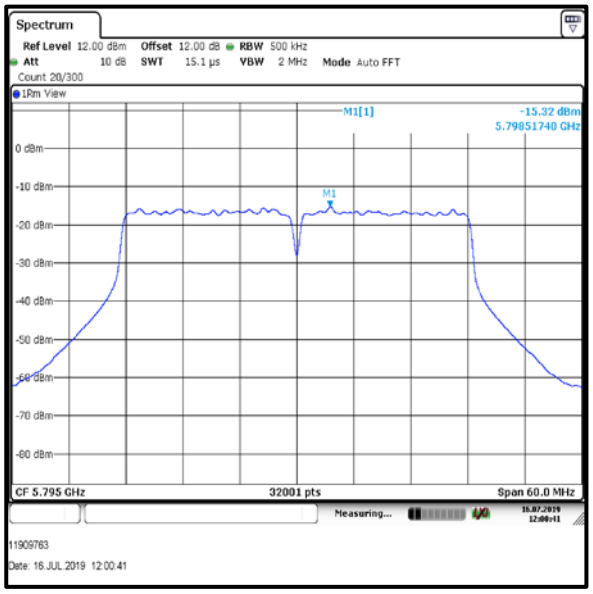


Top Channel

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 2 / PWL 11 / 23 dBi Antenna Group



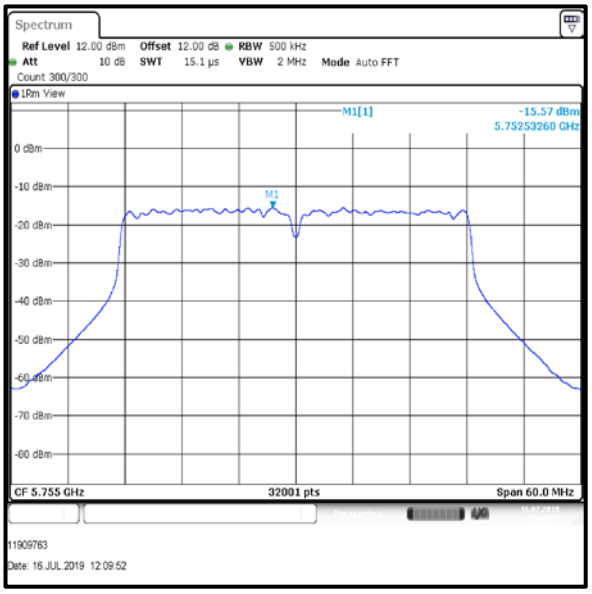
Bottom Channel



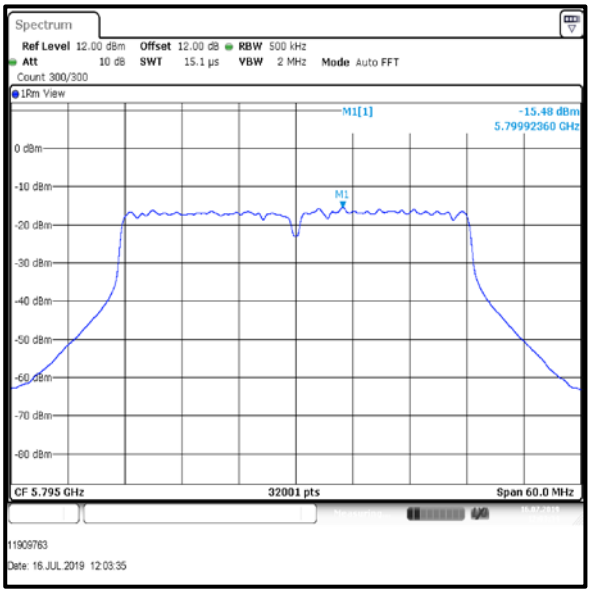
Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 3 / PWL 11 / 23 dBi Antenna Group

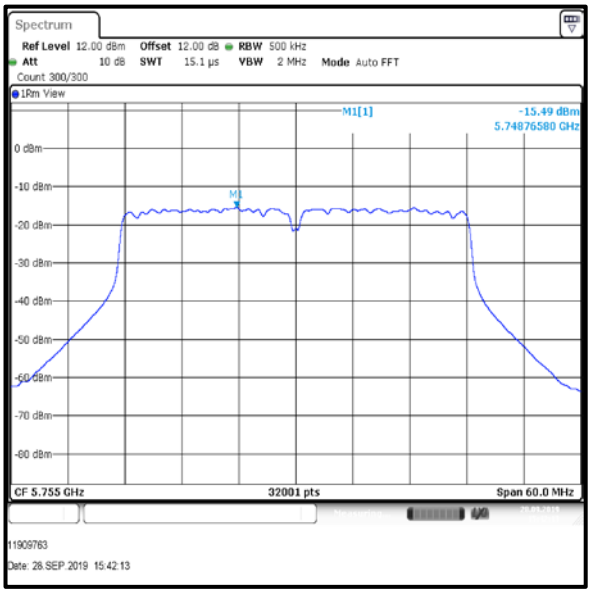


Bottom Channel

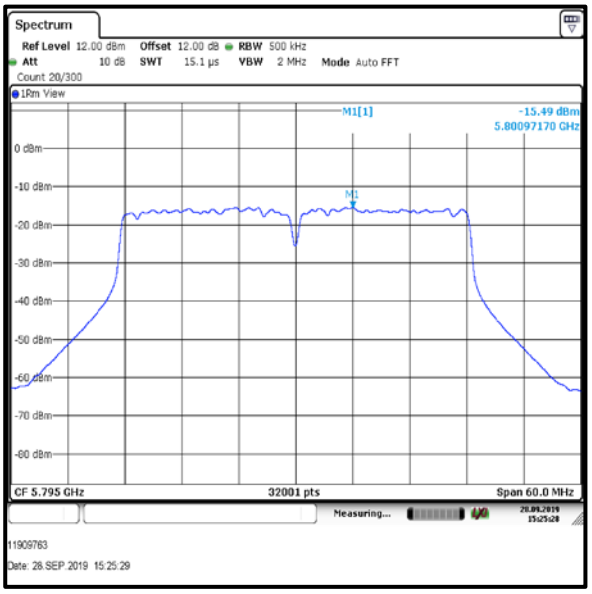


Top Channel

Results: 802.11ac / HT40 / MCS0 / MIMO / Port 4 / PWL 11 / 23 dBi Antenna Group



Bottom Channel



Top Channel

Transmitter Maximum Power Spectral Density (continued)

Results: 802.11ac / HT80 / MCS0 / MIMO / Port 1+2+3+4 / PWL 11 / 23 dBi Antenna Group

Channel	Port 1			Port 2		
	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)	PPSD (dBm /500k Hz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500k Hz)
Single	-18.5	0.5	-18.0	-18.9	0.5	-18.4

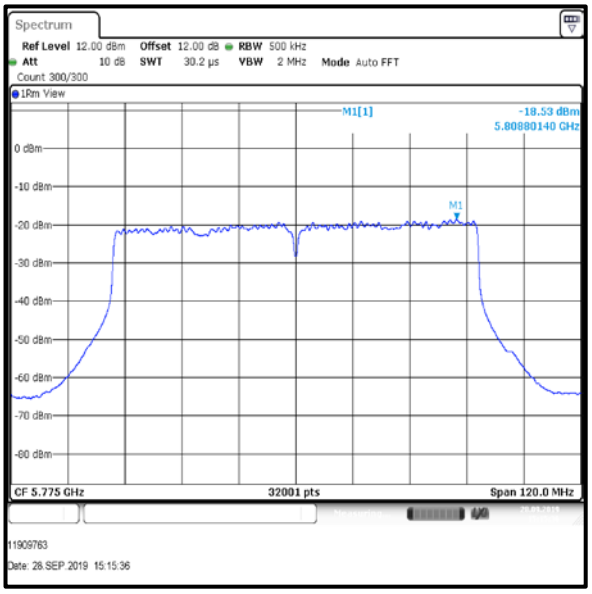
Channel	Port 3			Port 4		
	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)	PPSD (dBm /500kHz)	Duty Cycle Correction (dB)	Corrected PPSD (dBm /500kHz)
Single	-18.6	0.5	-18.1	-18.8	0.5	-18.3

Channel	Corrected PPSD Port 1 (dBm/500 kHz)	Corrected PPSD Port 2 (dBm/500 kHz)	Corrected PPSD Port 3 (dBm/500 kHz)	Corrected PPSD Port 4 (dBm/500 kHz)	Combined PPSD (dBm/500 kHz)	Limit (dBm/500kHz)	Margin (dB)	Result
Single	-18.0	-18.4	-18.1	-18.3	-12.2	15.7	27.9	Complied

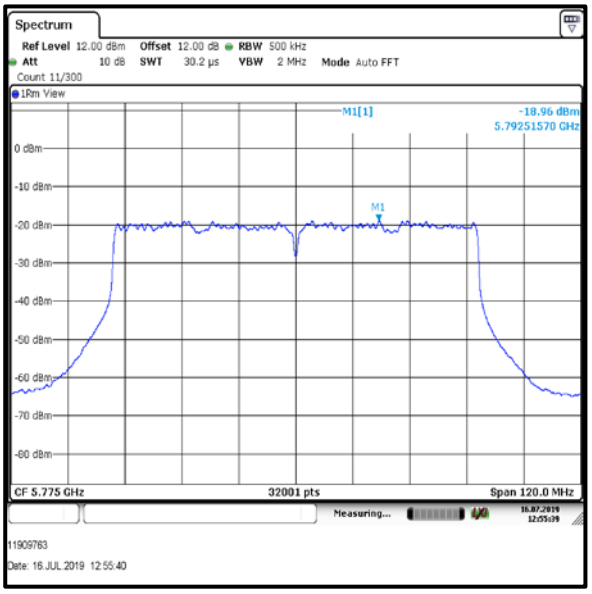
Result: Pass

Transmitter Maximum Power Spectral Density (continued)

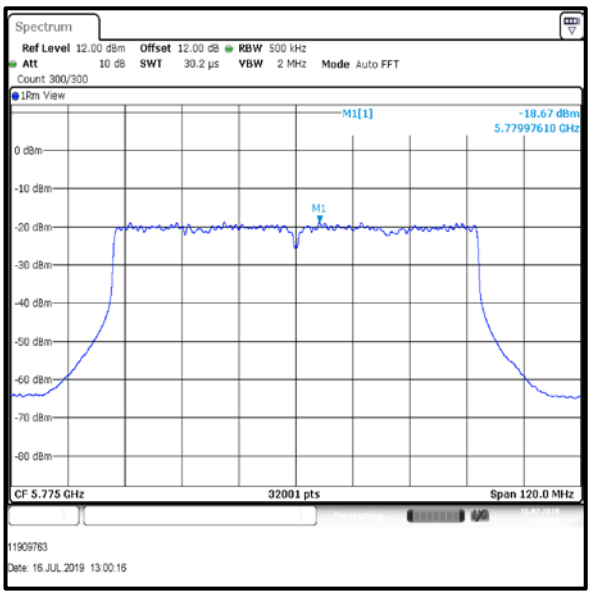
Results: 802.11ac / HT80 / MCS0 / MIMO / Port 1+2+3+4 / PWL 11 / 23 dBi Antenna Group



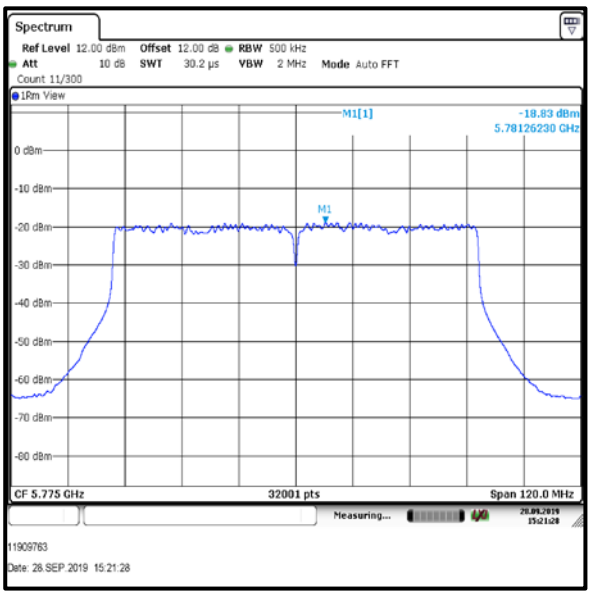
Single Channel Port 1



Single Channel Port 2



Single Channel Port 3



Single Channel Port 4

5.2.7. Transmitter Cabinet Radiated Emissions

Test Summary:

Test Engineer:	Krume Ivanov	**Test Date:**	17 April 2019
Test Sample Serial Number:	192.168.0.80		
Test Site Identification	SR 1/2		

FCC Reference:	Part 15.407 (b)(4),(6),(7) & 15.209(a)
Test Method Used:	FCC KDB 789033 D02 Section II.G.1, II.G.2, II.G.3 & II.G.4 ANSI C63.10 Sections 6.3 and 6.4
Frequency Range	9 kHz to 30 MHz

Environmental Conditions:

Temperature (°C):	20
Relative Humidity (%):	30

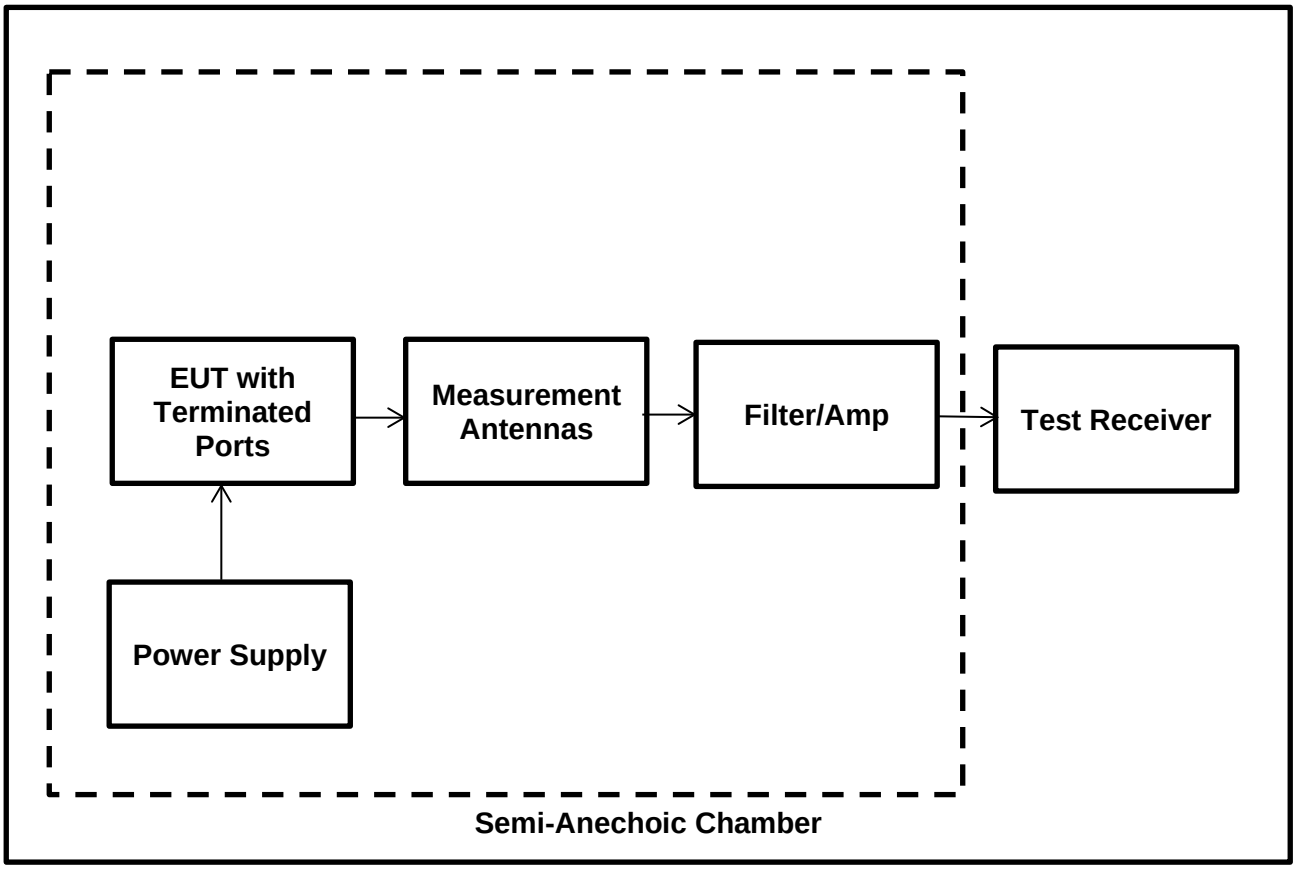
Notes:

1. According to FCC KDB 789033 D02 Section II.G.3.b)(i) & (ii) Transmitter Cabinet Radiated Emissions were performed by terminating EUT's all 4-MIMO Ports with 50 Ω (nominal impedance of antennas).
2. Maximum power setting (PWL) amongst all supported SISO & MIMO modes & listed antenna groups has been used.
3. Therefore, transmitter cabinet radiated emissions are valid for all supported Bandwidths, SISO- MIMO modes & listed antenna groups in this report.
4. The preliminary scans showed similar emission levels below 30 MHz, amongst all supported Bandwidths, SISO & MIMO modes and channel of operations. Therefore final Transmitter Cabinet Radiated Emissions measurements were performed with the EUT set to the worst case modes.
    - Terminated Ports 1+2+3+4 | a Mode | 6 Mbps | B.W. 20 MHz | PWL 26 | CH 149
    - Terminated Ports 1+2+3+4 | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 157
    - Terminated Ports 1+2+3+4 | ac Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 165
5. In accordance with FCC KDB 414788, an alternative test site may be used for the measurement. Therefore the result from the semi-anechoic chamber tests is shown in this section of the test report.
6. Measurements below 30 MHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) at a distance of 3 meters. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. The measurement loop antenna height was 1 meter.
7. Pre-scans were performed and markers placed on the highest measured levels. The test receiver was set to :
    - Frequency range: 9 kHz-150kHz : RBW: 300 Hz /VBW: 1 kHz
    - Frequency range: 150 kHz – 30 MHz: RBW: 10 kHz /VBW: 30 kHz
    - Detector : Max Peak detector
    - Trace Mode : Max Hold.
8. Final measurements were performed on the marker frequencies and the results entered into the table below. All other emissions were greater than 20 dB below the applicable limit, below the noise floor of the measurement system or ambient.
9. The final measured value, for the given emission, in the table below incorporates the measured cabinet radiated emission level, distance extrapolation factor, calibrated antenna factor and cable loss.

10. EMC32 V10.1.0 Software was used for these measurements.

Transmitter Cabinet Radiated Emissions (continued)

Test Setup:

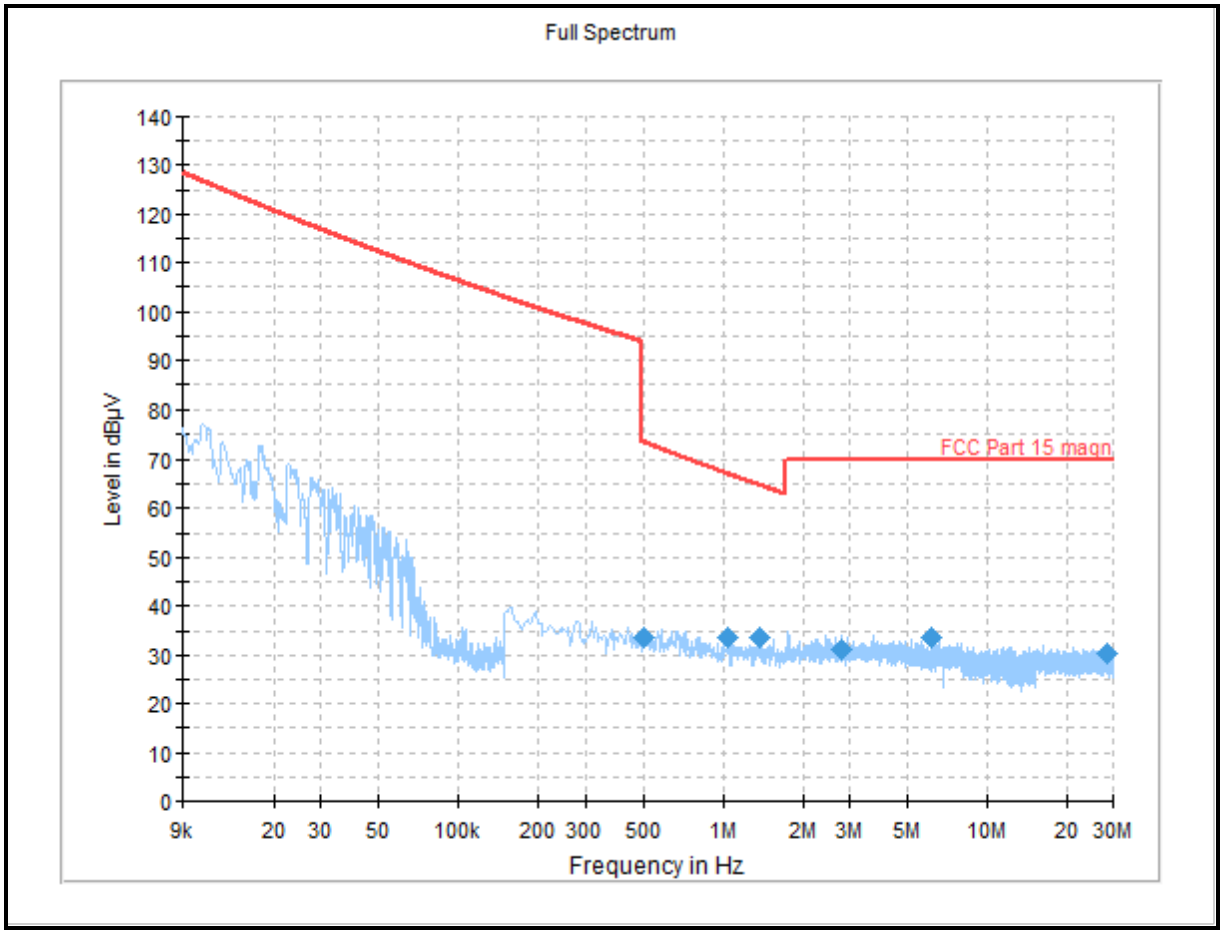


Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11a / 20 MHz / 6 Mbps / Terminated Ports 1+2+3+4 / PWL 26 / CH 149

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
0.497	Horizontal	33.48	73.66	40.18	Complied
1.029	Horizontal	33.48	67.14	33.66	Complied
1.360	Horizontal	33.49	64.81	31.32	Complied
2.796	Vertical	31.08	70.00	38.92	Complied
6.100	Horizontal	33.48	70.00	36.52	Complied
28.295	Vertical	30.26	70.00	39.74	Complied

Plot : 9 k HZ to 30 MHz



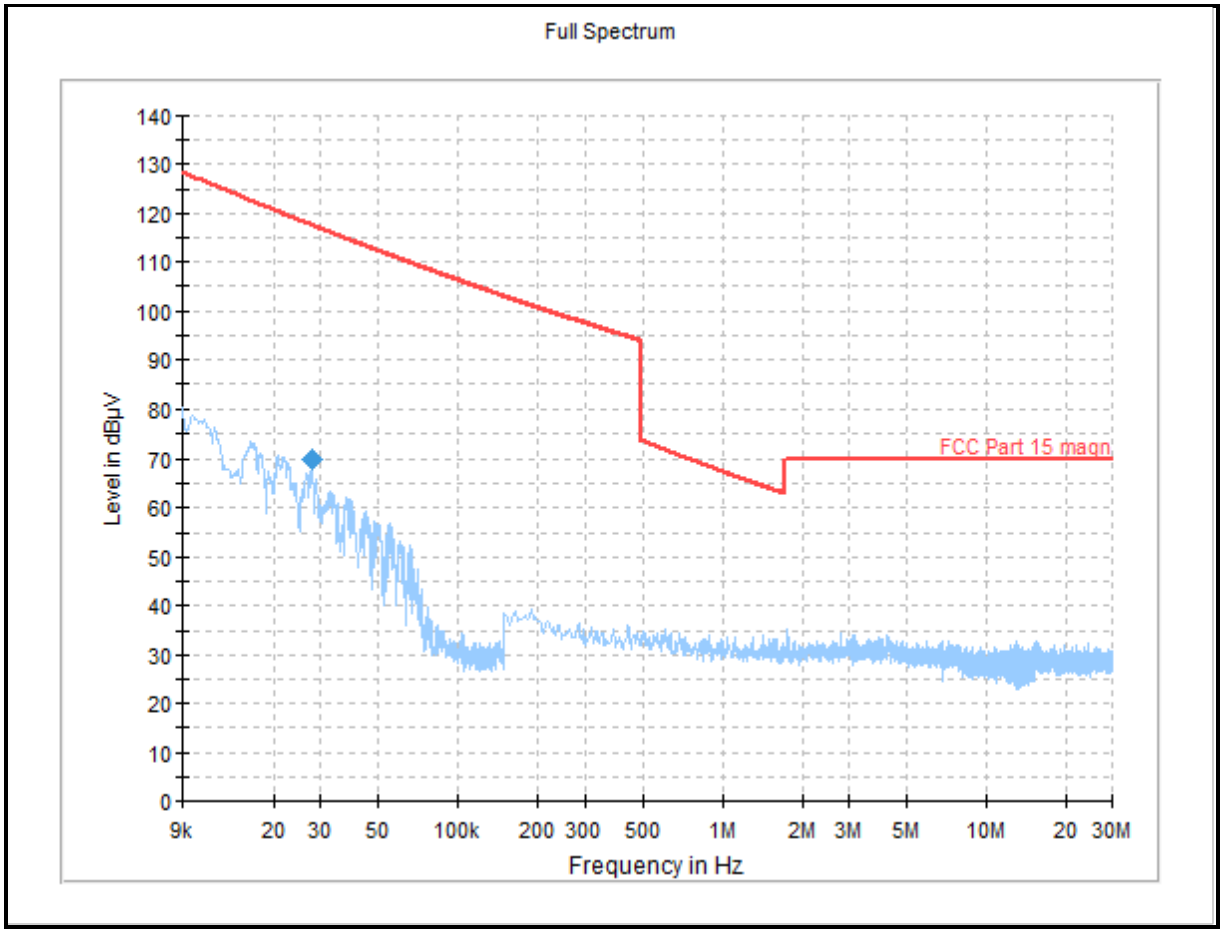
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11n / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 157

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
0.027	Horizontal	69.85	117.60	47.75	Complied

Plot : 9 k HZ to 30 MHz



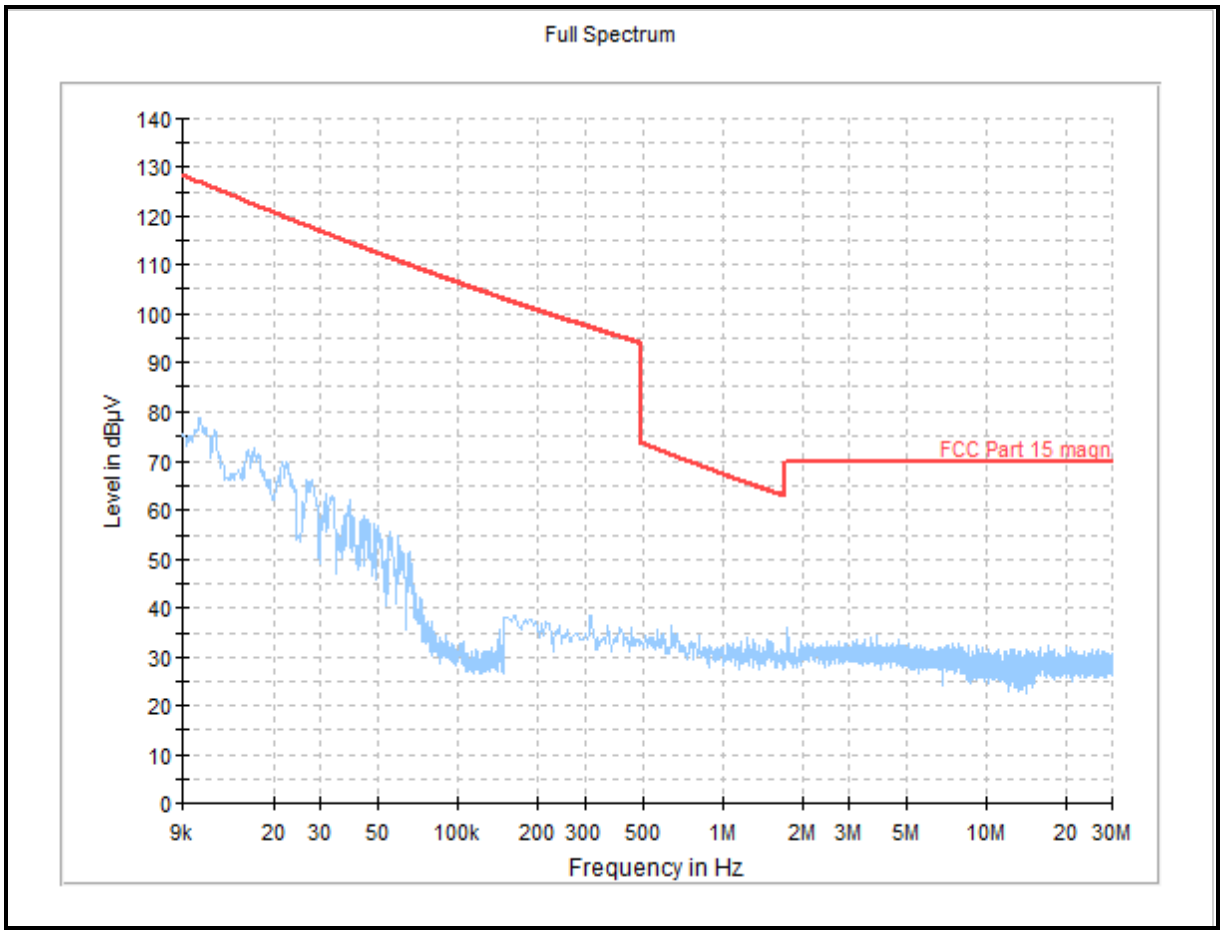
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11ac / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 165

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
No criticals spurious emissions was found					

Plot : 9 k HZ to 30 MHz



Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Test Summary:

Test Engineer:	Krume Ivanov	**Test Date:**	17 April 2019
Test Sample Serial Number:	192.168.0.80		
Test Site Identification	SR 1/2		

FCC Reference:	Part 15.407 (b)(4),(6),(7) & 15.209(a)
Test Method Used:	FCC KDB 789033 D02 Section II.G.1, II.G.2, II.G.3 & II.G.4 ANSI C63.10 Sections 6.3 and 6.5
Frequency Range	30 MHz to 1000 MHz

Environmental Conditions:

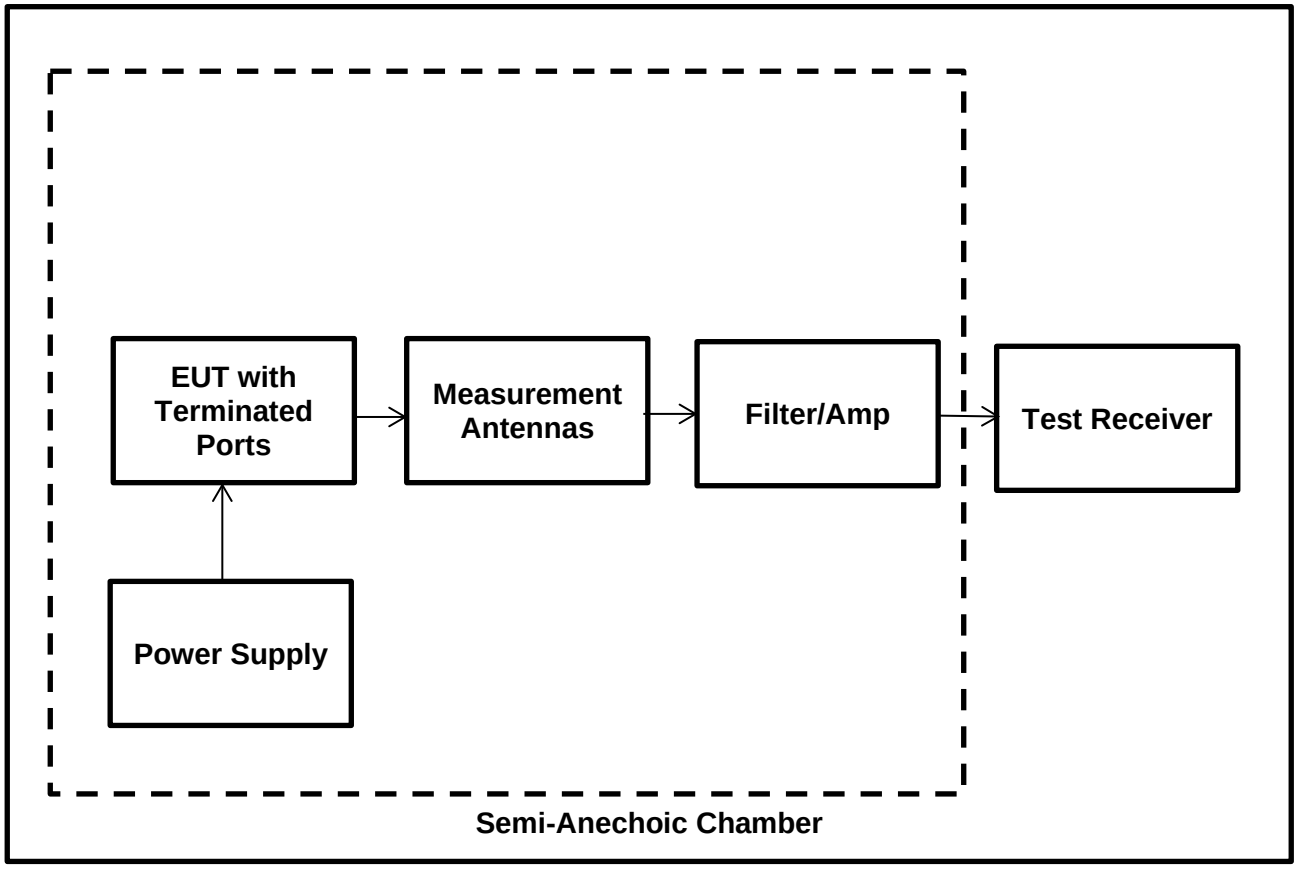
Temperature (°C):	22
Relative Humidity (%):	31

Notes:

1. According to FCC KDB 789033 D02 Section II.G.3.b)(i) & (ii) Transmitter Cabinet Radiated Emissions were performed by terminating EUT's all 4-MIMO Ports with 50 Ω (nominal impedance of antennas).
2. Maximum power setting (PWL) amongst all supported SISO & MIMO modes & listed antenna groups has been used.
3. Therefore, transmitter cabinet radiated emissions are valid for all supported Bandwidths, SISO- MIMO modes & listed antenna groups in this report.
4. The preliminary scans showed similar emission levels below 1 GHz, amongst all supported Bandwidths, SISO & MIMO modes and channel of operations. Therefore final Transmitter Cabinet Radiated Emissions measurements were performed with the EUT set to the worst case modes.
    - Terminated Ports 1+2+3+4 | a Mode | 6 Mbps | B.W. 20 MHz | PWL 26 | CH 149
    - Terminated Ports 1+2+3+4 | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 157
    - Terminated Ports 1+2+3+4 | ac Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 165
5. Measurements below 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) at a distance of 3 meters. The EUT was placed at a height of 80 cm above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 meter to 4 meters.
6. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold.
7. Final measurements were performed on the marker frequencies and the results entered into the table below. The test receiver resolution bandwidth was set to 120 kHz, using a max-peak detector and span big enough to see the whole emission.
8. In accordance with ANSI C63.10 Section 12.7.5 Compliance is determined using max-peak detector, as an alternative to quasi-peak detector.
9. The measured value, for the given emission, in the table below incorporates the measured cabinet radiated emission level, calibrated antenna factor and cable loss.
10. EMC32 V10.1.0 Software was used for these measurements.

Transmitter Cabinet Radiated Emissions (continued)

Test Setup:

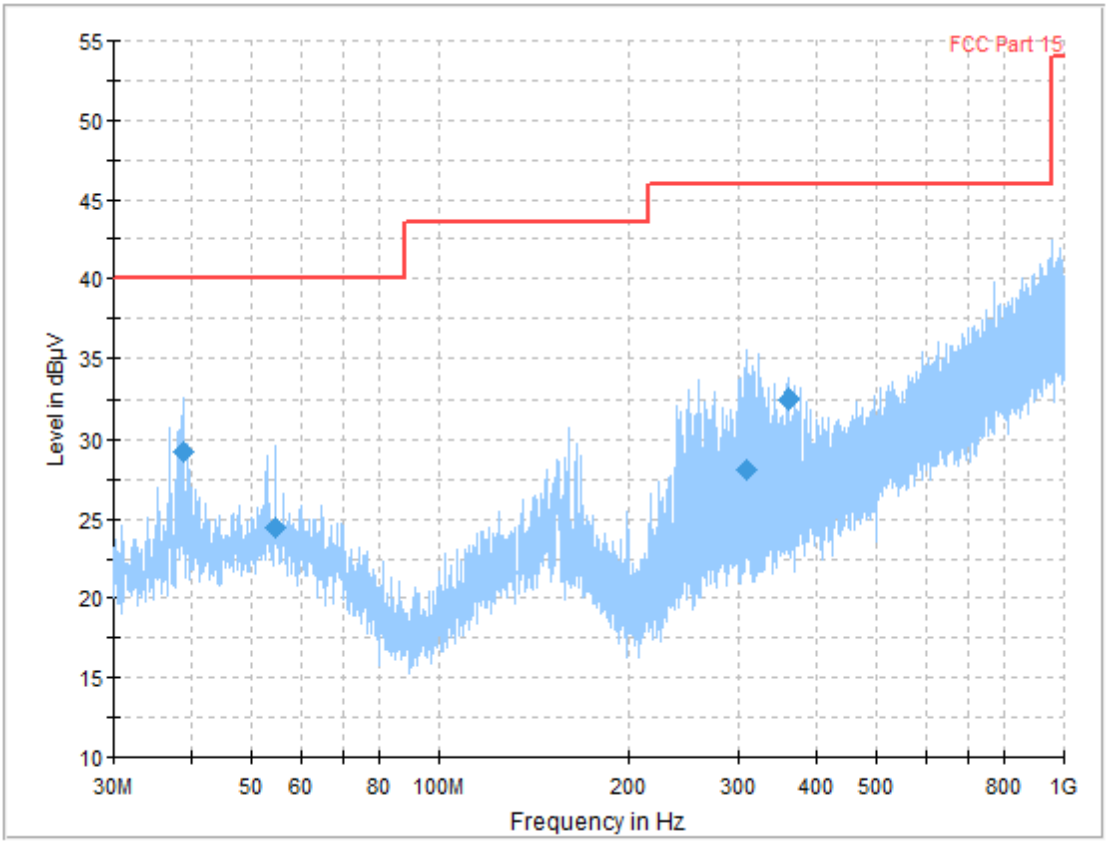


Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11a / 20 MHz / 6 Mbps / Terminated Ports 1+2+3+4 / PWL 26 / CH 149

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
38.730	Vertical	29.21	40.00	10.79	Complied
54.525	Vertical	24.45	40.00	15.55	Complied
308.166	Vertical	28.14	46.00	17.86	Complied
361.166	Horizontal	32.49	46.00	13.51	Complied

Plot : 30 MHz to 1 GHz



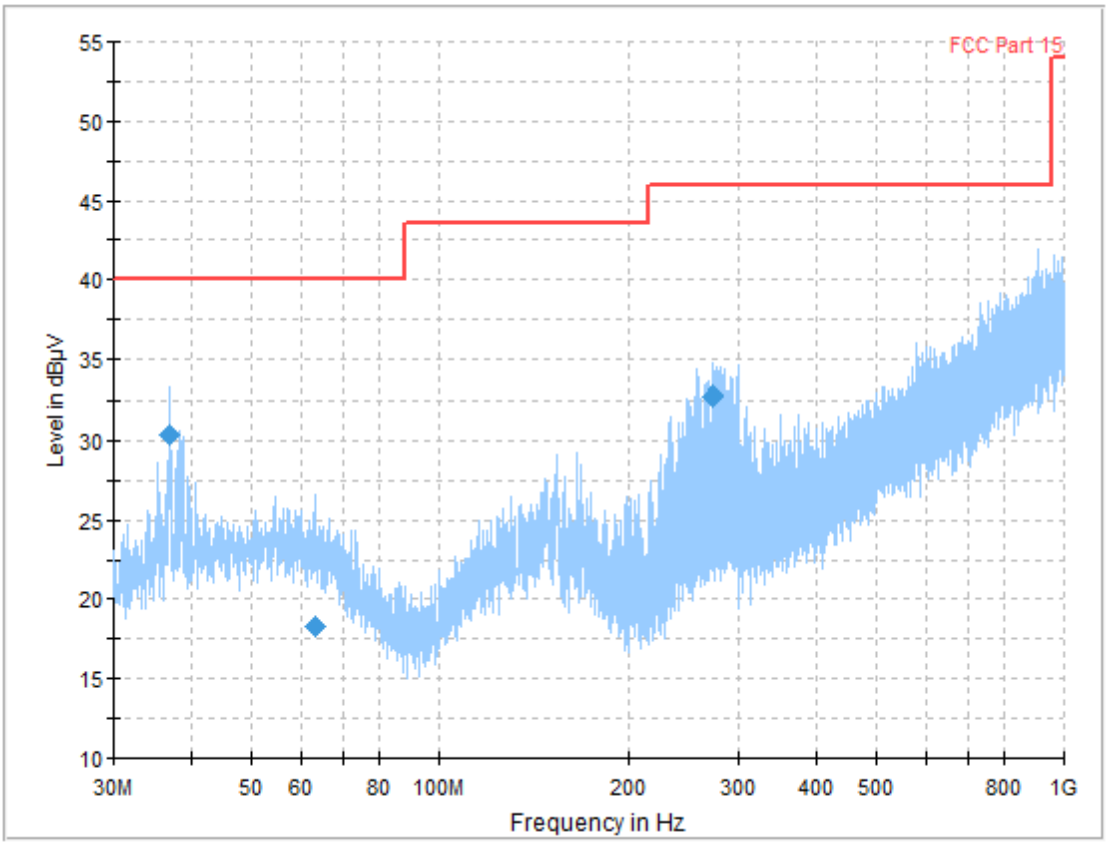
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11n / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 157

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
36.930	Vertical	30.41	40.00	9.59	Complied
63.435	Vertical	18.28	40.00	21.72	Complied
272.910	Horizontal	32.75	46.00	13.25	Complied

Plot : 30 MHz to 1 GHz



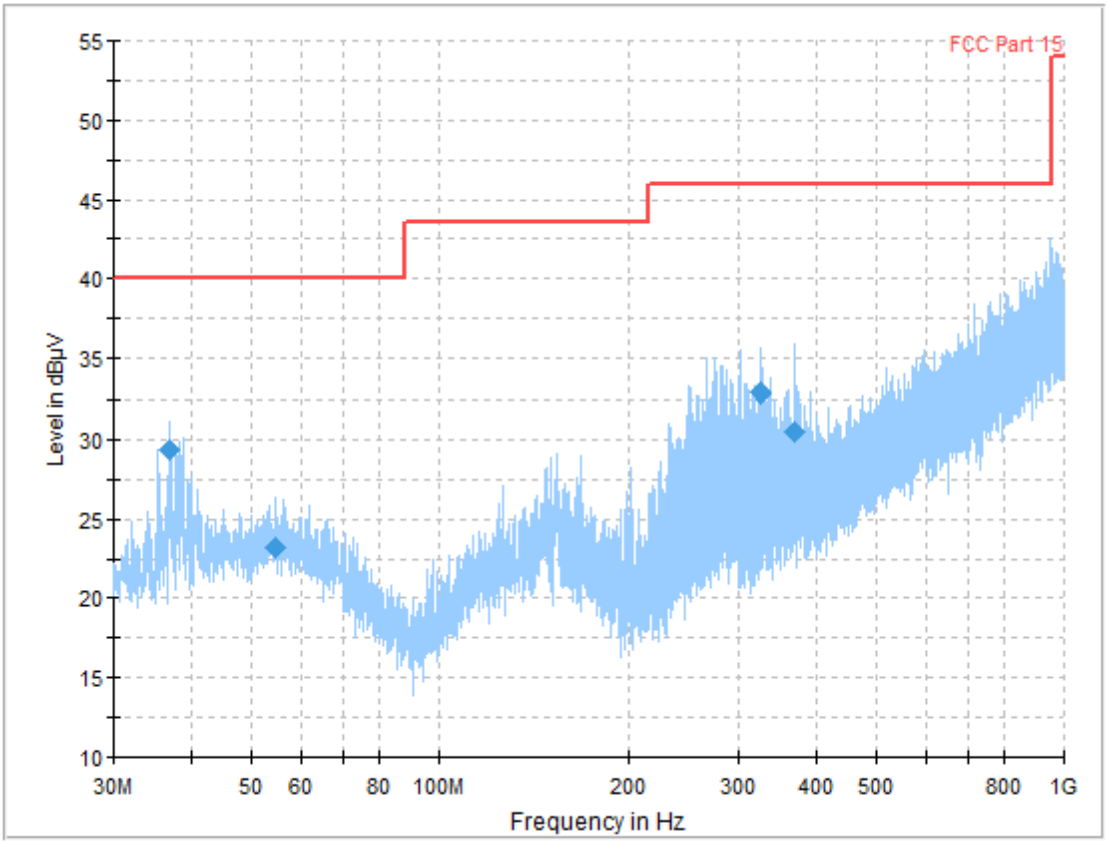
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11ac / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 165

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
36.975	Vertical	29.37	40.00	10.63	Complied
54.660	Vertical	23.21	40.00	16.79	Complied
325.933	Horizontal	32.86	46.00	13.14	Complied
368.133	Horizontal	30.53	46.00	15.47	Complied

Plot : 30 MHz to 1 GHz



Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Test Summary:

Test Engineer:	Krume Ivanov	**Test Date:**	21 October 2019
Test Sample Serial Number:	192.168.0.80		
Test Site Identification	SR 1/2		

FCC Reference:	Part 15.407 (b)(4),(6),(7) & 15.209(a)
Test Method Used:	FCC KDB 789033 D02 Section II.G.1, II.G.2, II.G.3, II.G.5 & II.G.6 ANSI C63.10 Sections 6.3 and 6.6
Frequency Range	1 GHz to 40 GHz

Environmental Conditions:

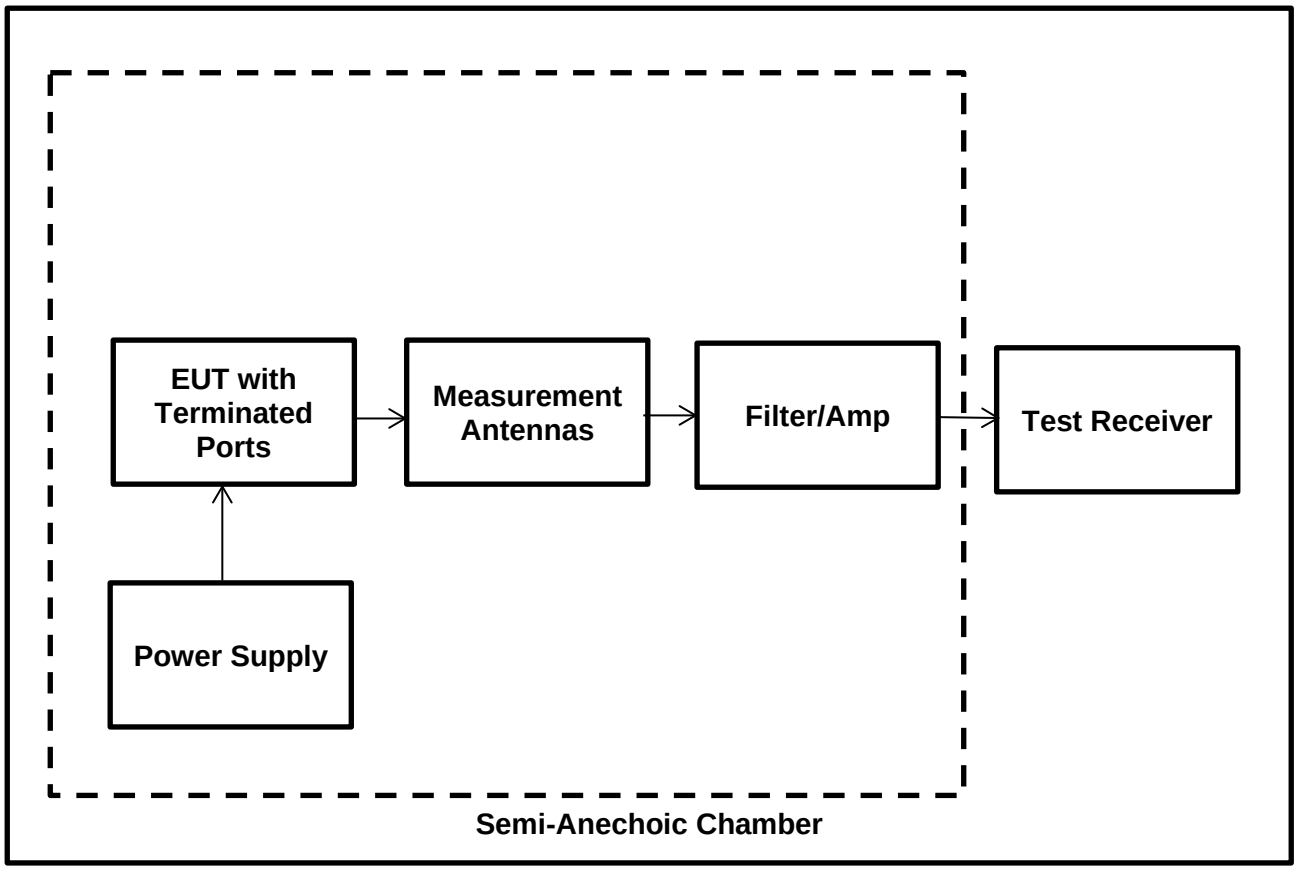
Temperature (°C):	20 to 24
Relative Humidity (%):	30 to 51

Notes:

1. According to FCC KDB 789033 D02 Section II.G.3.b)(i) & (ii) Transmitter Cabinet Radiated Emissions were performed by terminating EUT's all 4-MIMO Ports with 50 Ω (nominal impedance of antennas).
2. Maximum power setting (PWL) amongst all supported SISO & MIMO modes & listed antenna groups has been used.
3. The emissions shown at frequencies approximately 5.7 GHz to 5.9 GHz on the 1 GHz to 18 GHz plots are the EUT fundamental for the given channel.
4. Therefore, transmitter cabinet radiated emissions are valid for all supported Bandwidths, SISO- MIMO modes & listed antenna groups in this report.
5. The preliminary scans showed similar emission levels below 18 GHz, amongst all supported Bandwidths, SISO & MIMO modes and channel of operations. Therefore final Transmitter Cabinet Radiated Emissions measurements were performed with the EUT set to the worst case modes.
    - Terminated Ports 1+2+3+4 | a Mode | 6 Mbps | B.W. 20 MHz | PWL 26 | CH 149
    - Terminated Ports 1+2+3+4 | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 157
    - Terminated Ports 1+2+3+4 | ac Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 165
6. Pre-scans above 1 GHz were performed in semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with absorbers on the ground at a distance of 3 meters. The EUT was placed at a height of 1.5 meters above the test chamber floor in the centre of the chamber turntable. All measurement antennas were placed at a fixed height of 1.5 meters above the test chamber floor, in line with the EUT. Final measurements above 1 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with absorbers on the ground at a distance of 3 meters. The EUT was placed at a height of 1.5 m above the reference ground plane in the centre of the chamber turntable. Maximum emission levels were determined by height searching the measurement antenna over the range 1 meter to 4 meters.
7. Pre-scans were performed and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. The sweep time was set to auto.
8. In accordance with ANSI C63.10 Section 6.6.4.3 (Note 1), if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
9. The final measured value, for the given emission, in the table below incorporates the measured cabinet radiated emission level, calibrated antenna factor and cable loss.

10. EMC32 V10.1.0 Software was used for these measurements.
11. The preliminary scans showed similar emission levels above 18 GHz, for each channel of operation. Therefore final radiated emissions measurements were performed with the EUT set to
    - Terminated Ports 1+2+3+4 | a Mode | 6 Mbps | B.W. 20 MHz | PWL 26 | CH 149
    - Terminated Ports 1+2+3+4 | ac Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 165
12. Pre-scans above 18 GHz were performed in a semi-anechoic chamber SR1/ 2 (Asset Number 1603665) with absorbers on the ground at a distance of 1 meters. The EUT was placed at a height of 1.5 meters above the test chamber floor in the centre of the chamber turntable. All measurement antenna was placed at a fixed height of 1.5 meters above the test chamber floor, in line with the EUT.
13. Pre-scans were performed and a marker placed on the highest measured level of the appropriate plot. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. The sweep time was set to auto.
14. In accordance with ANSI C63.10 Section 6.6.4.3 (Note 1), if the peak measured value complies with the average limit, it is unnecessary to perform an average measurement.
15. The final measured value, for the given emission, in the table below incorporates the measured cabinet radiated emission level, calibrated antenna factor and cable loss.
16. The final measured values at 1 meter distance are then compared with extrapolated limits values (3 to 1 meter) by addting relevant distance extrapolation factor of 9.54 dB to FCC 15.209 (3 meter) limits.
17. Toyo EMI | RE measurement software EP5/RE Ver 4.0.1 Software was used for these measurements.

Test Setup:

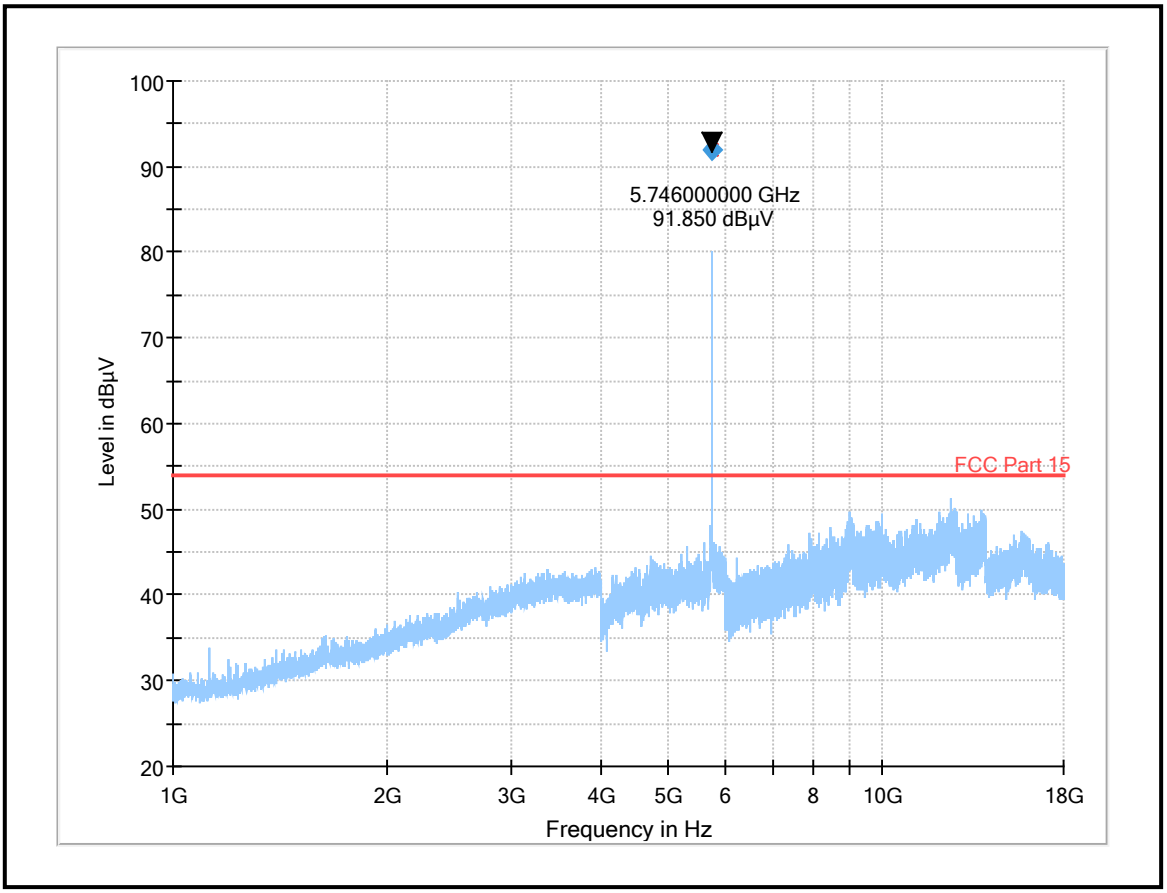


Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11a / 20 MHz / 6 Mbps / Terminated Ports 1+2+3+4 / PWL 26 / CH 149

Frequency (MHz)	Antenna Polarization	MaxPeak Level (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
No spurious emissions were detected					

Plot: 1 GHz to 18 GHz



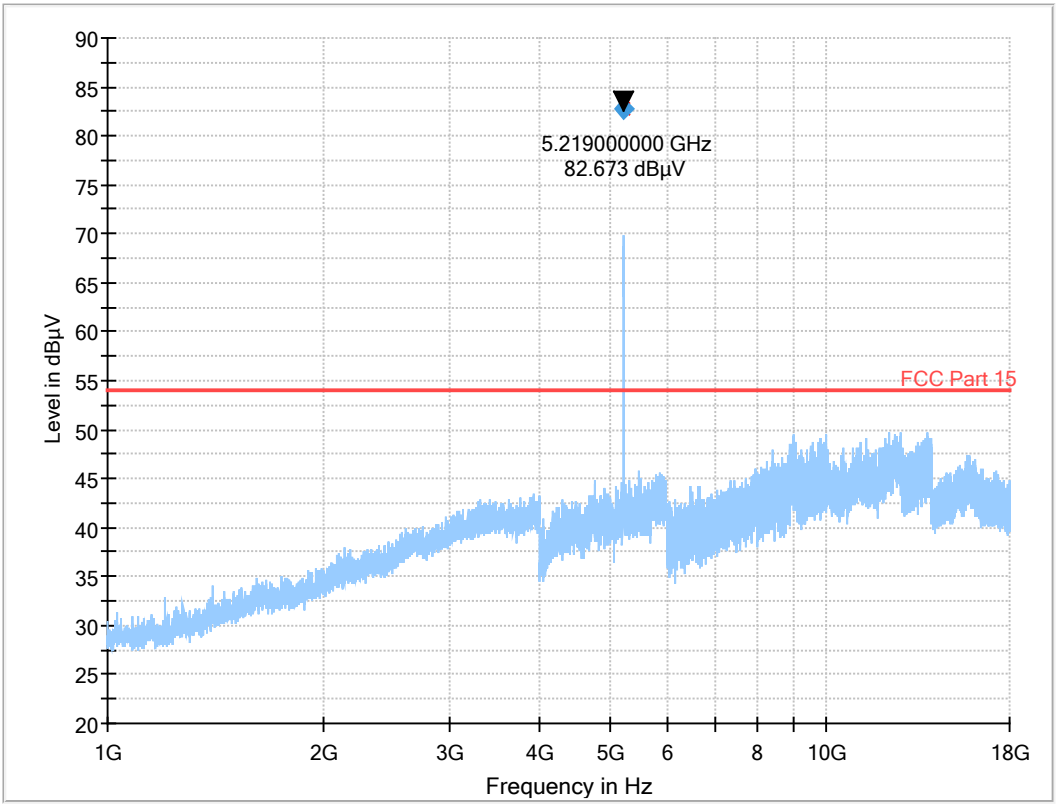
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11n / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 157

Frequency (MHz)	Antenna Polarization	MaxPeakLevel (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
No spurious emissions were detected					

Plot: 1 GHz to 18 GHz



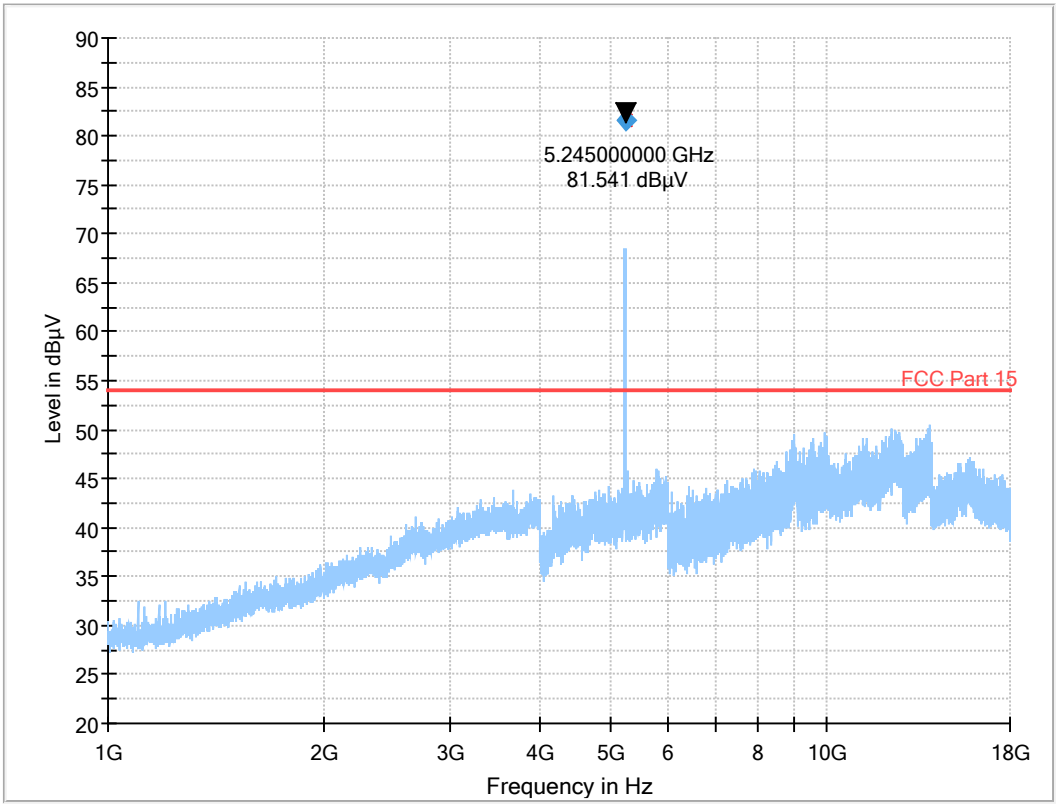
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11ac / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 165

Frequency (MHz)	Antenna Polarization	MaPeakLevel (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)	Result
No spurious emissions were detected					

Plot: 1 GHz to 18 GHz



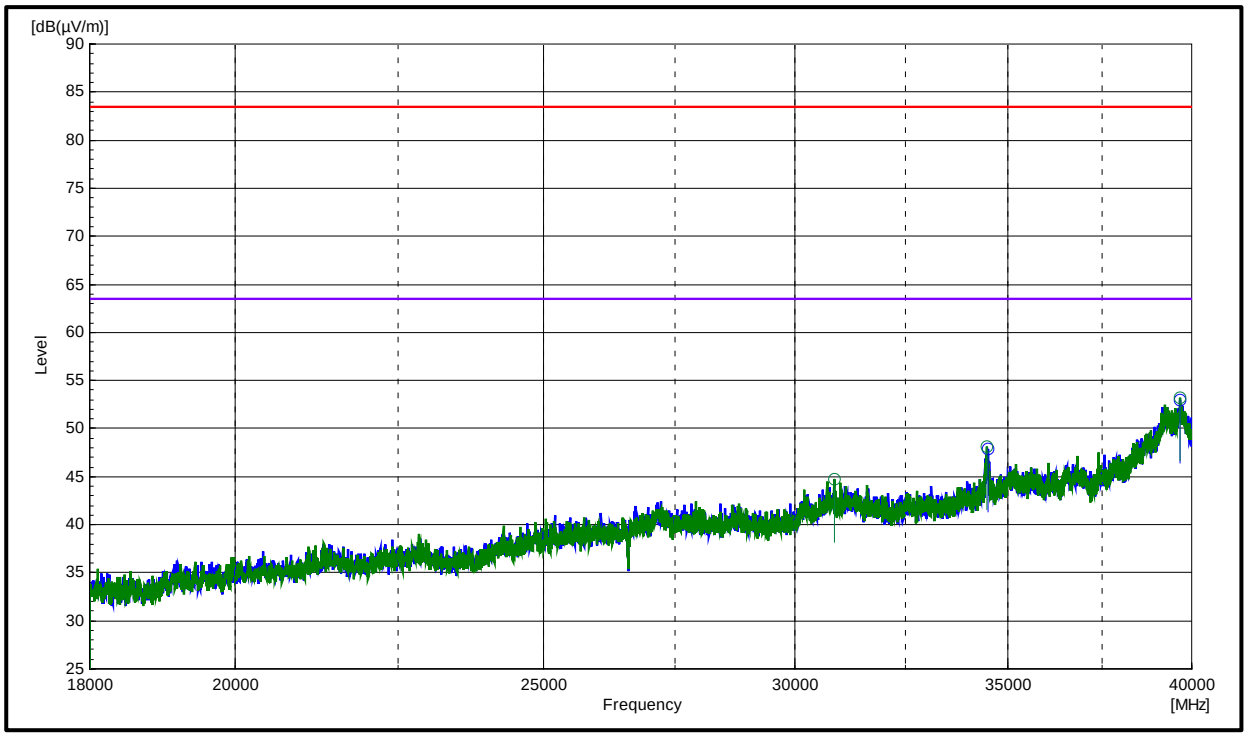
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11a / 20 MHz / 6 Mbps / Terminated Ports 1+2+3+4 / PWL 26 / CH 149

Frequency (MHz)	Antenna Polarization	MaxPeak Level @1m (dBµV/m)	Average Limit @1m (dBµV/m)	Margin (dB)	Result
30865.386	Vertical	44.80	63.54	18.74	Complied
34479.168	Vertical	48.10	63.54	15.44	Complied
34511.216	Horizontal	47.90	63.54	15.64	Complied
39667.468	Horizontal	53.00	63.54	10.54	Complied
39671.476	Vertical	53.20	63.54	10.34	Complied

Plot: 18 GHz to 40 GHz



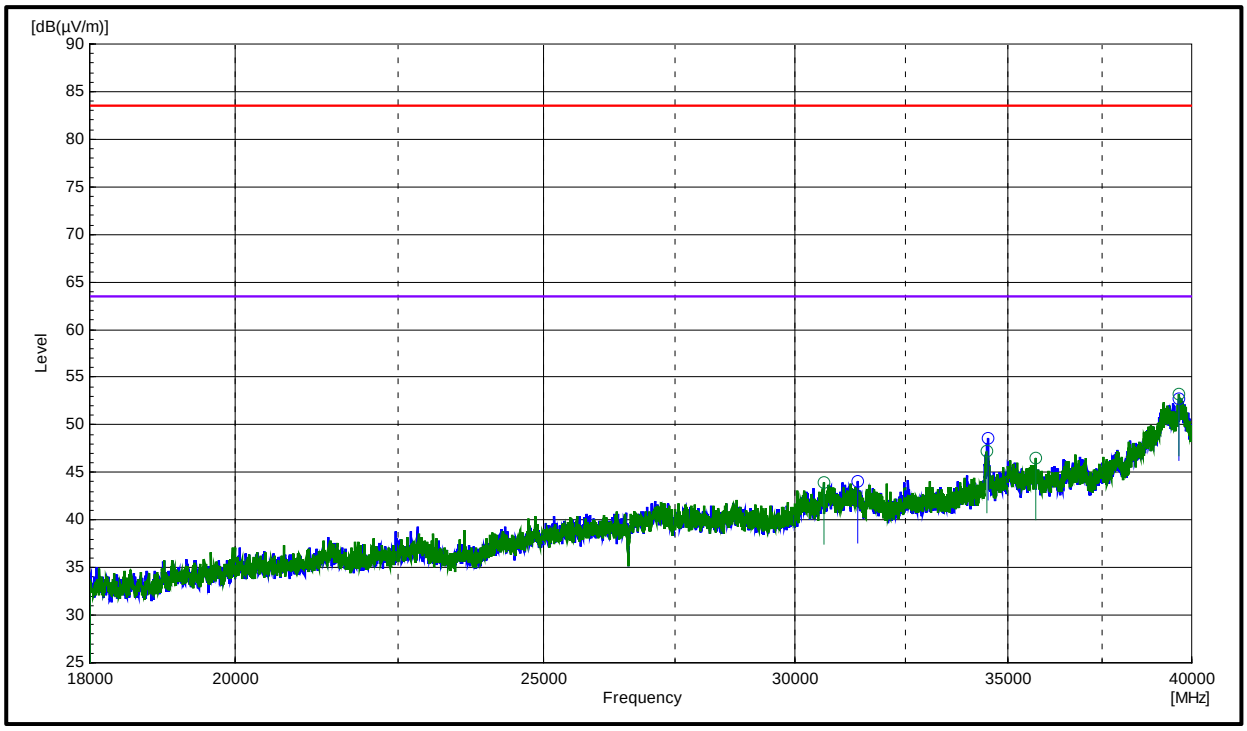
Result: Pass

Transmitter Cabinet Radiated Emissions (continued)

Results: 802.11ac / 20 MHz / MCS0 / Terminated Ports 1+2+3+4 / PWL 26 / CH 157

Frequency (MHz)	Antenna Polarization	MaxPeak Level @1m (dBµV/m)	Average Limit @1m (dBµV/m)	Margin (dB)	Result
30633.014	Vertical	43.90	63.54	19.64	Complied
31414.264	Horizontal	44.10	63.54	19.44	Complied
34479.168	Vertical	47.30	63.54	16.24	Complied
34503.204	Horizontal	48.50	63.54	15.04	Complied
35721.152	Vertical	46.50	63.54	17.04	Complied
39623.396	Vertical	53.30	63.54	10.24	Complied

Plot: 18 GHz to 40 GHz



Result: Pass

5.2.8. Transmitter Conducted Spurious Emissions

Test Summary:

Test Engineer:	Abdoufataou Salifou	**Test Date:**	31 July 2019
Test Sample Serial Number:	192.168.0.60		
Test Site Identification	SR 9		

FCC Reference:	Parts 15.407(b)(4),(6),(7) & 15.209(a)
Test Method Used:	FCC KDB 789033 D02 Section II.G.1, II.G.2, II.G.3 & II.G.4 FCC KDB 662911 D01 Section E)3)(iii) referring Section E)2)c)
Frequency Range:	9 kHz to 1000 MHz

Environmental Conditions:

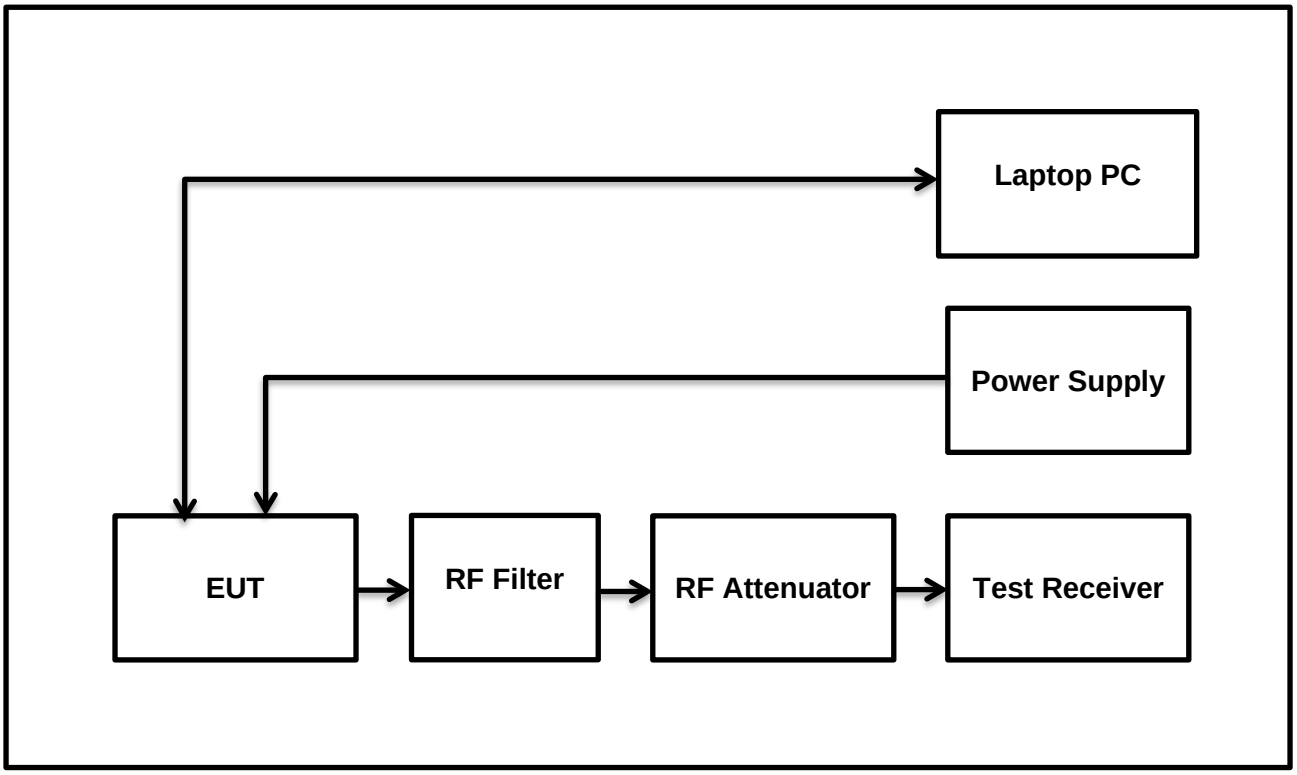
Temperature (°C):	24
Relative Humidity (%):	44

Notes:

1. According to FCC KDB 789033 D02 Section II.G.3.b) to compliance of Transmitter Cabinet Radited Emissions additional transmitter conducted spurious emissions were performed.
2. Maximum power setting (PWL) amongst all supported SISO & MIMO modes & listed antenna groups has been used.
3. Therefore, transmitter cabinet radiated emissions are valid for all supported Bandwidths, SISO - MIMO modes & listed antenna groups in this report.
4. During initial investigations amongst all supported Bandwidths, SISO & MIMO modes n HT20 SISO mode showed worst case results. Therefore final transmitter conducted spurious emissions measurements were performed with the EUT set to the worst case n | SISO mode.
5. The preliminary scans showed similar emission levels below 1 GHz, amongst each test channel of operations. Therefore final transmitter conducted spurious emissions measurements were performed with the EUT set to the bottom channel only.
6. The EUT was configured in following test modes:
   - 8 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 149
   - 9 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 149
   - 23 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26 | CH 149
7. The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors. The RF cable attenuation (maximum 2.0 dB at the tested frequencies) from the EUT to Analyzer including the 10 dB attenuation at the Spectrum Analyzer input was added as a reference level offset (12.0 dB) to each of the conducted plots.
8. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 100 kHz and video bandwidth 300 kHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold
9. The observed emissions levels (in dBm) on SISO Port are reported into the table.
10. According to FCC KDB 789033 D02 Section II.G.1e) a ground reflection factor was added.
    - Frequencies below 30 MHz: ground reflection factor of 4.7 dB
    - Frequencies between 30 MHz to 1000 MHz: ground reflection factor of 6.0 dB
11. Relevant directional Antenna Gain was added for each type of listed Antenna Groups.

12. According to FCC KDB 662911 D01 Section E)3)(iii) referring Section E)2)c); a factor 10 log(N_{ANT}) dB, (where N_{ANT} is the number of outputs) was added. Since the EUT has 4 MIMO ports a factor 6.02 dB was added .
13. In accordance with KDB 789033 G.2.d)(iii); transmitter conducted spurious emissions dBm levels have been converted to dBµV/m levels by adding a conversion factor of 95.2.
14. As per applicant's declaration 23 dBi Antenna shall be only used with RF cable of length 10 m having 8.8 dB Attenuation @ 5 GHz bands. Therefore Effective Antenna Gain = 23 dBi – 8.8 dB = 14.2 dBi.

Test Setup:



Transmitter Conducted Spurious Emissions (continued)

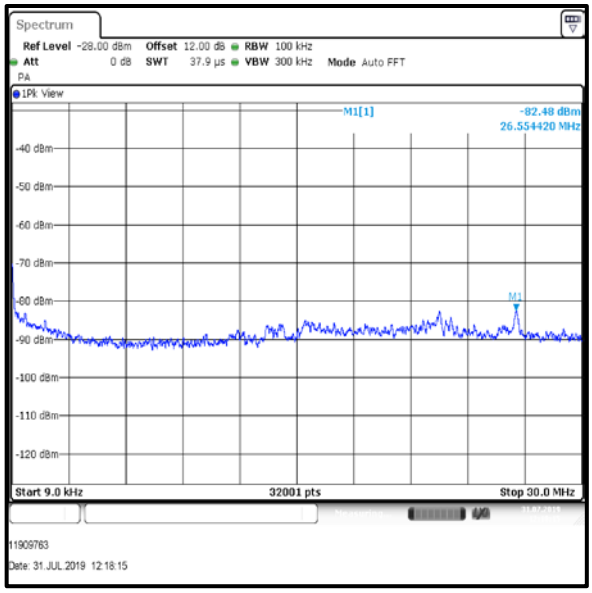
8 dBi Antenna Group

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 8 dBi Antenna Group

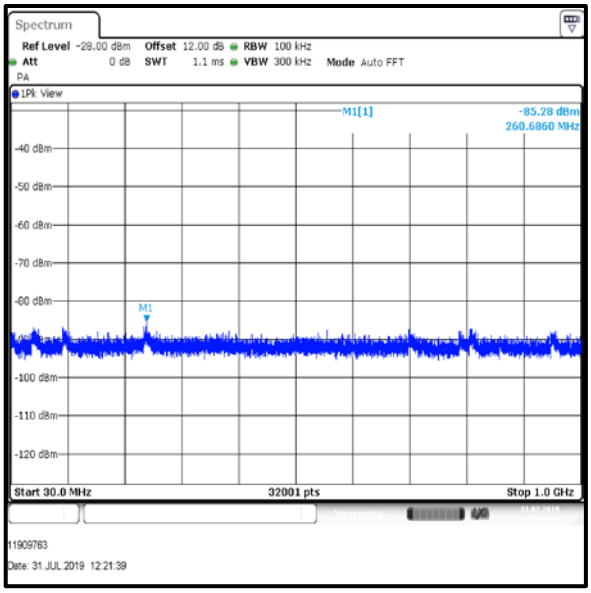
Frequency (MHz)	Analyzer Peak Level (dBm)	Ground Reflection Factor (dB)	Antenna Gain (dBi)	4-Port MIMO Antenna Factor (dB)	Corrected Peak Level (dBm)
26.584	-82.41	6.0	8.0	6.02	-62.39
260.686	-84.67	4.7	8.0	6.02	-65.95

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dBμV/m) Factor	Converted Field Strength Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
26.584	-62.39	95.2	32.81	40.0	7.19	Complied
260.686	-65.95	95.2	29.25	46.0	16.75	Complied

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 8 dBi Antenna Group



Plot:9 kHz to 30 MHz



Plot:30 MHz to 1 GHz

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see table above.

Result: Pass

Transmitter Conducted Spurious Emissions (continued)

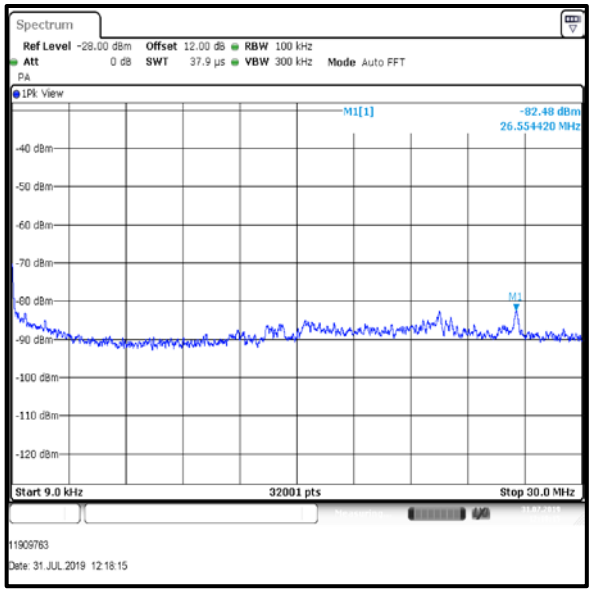
9 dBi Antenna Group

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 9 dBi Antenna Group

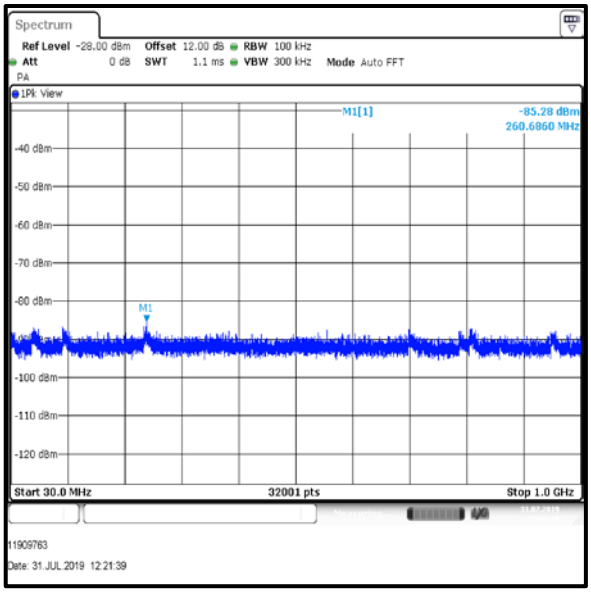
Frequency (MHz)	Analyzer Peak Level (dBm)	Ground Reflection Factor (dB)	Antenna Gain (dBi)	4-Port MIMO Antenna Factor (dB)	Corrected Peak Level (dBm)
26.584	-82.41	6.0	9.0	6.02	-61.39
260.686	-84.67	4.7	9.0	6.02	-64.95

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dBμV/m) Factor	Converted Field Strength Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
26.584	-61.39	95.2	33.81	40.0	6.19	Complied
260.686	-64.95	95.2	30.25	46.0	15.75	Complied

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 9 dBi Antenna Group



Plot:9 kHz to 30 MHz



Plot:30 MHz to 1 GHz

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see table above.

Result: Pass

Transmitter Conducted Spurious Emissions (continued)

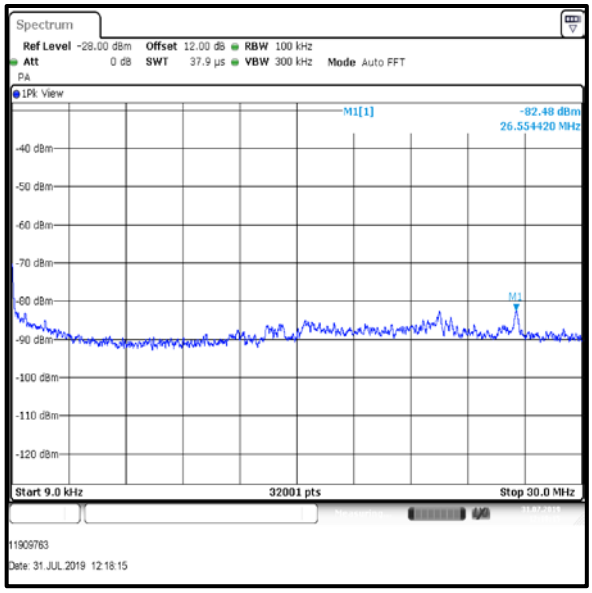
23 dBi Antenna Group

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 23 dBi Antenna Group

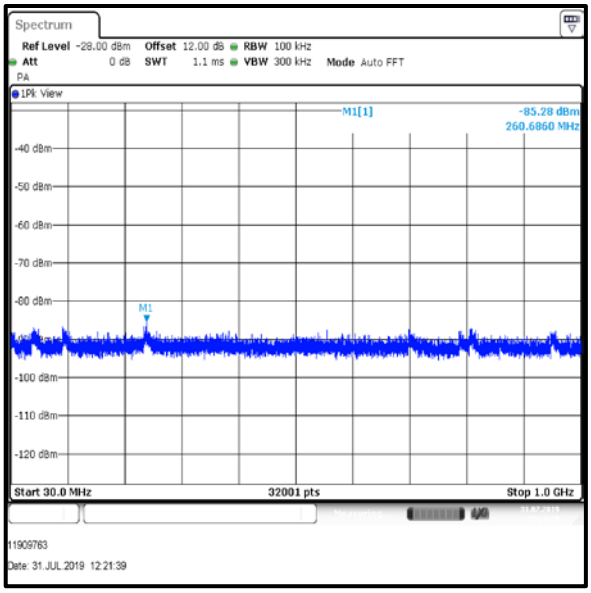
Frequency (MHz)	Analyzer Peak Level (dBm)	Ground Reflection Factor (dB)	Antenna Gain (dBi)	4-Port MIMO Antenna Factor (dB)	Corrected Peak Level (dBm)
26.584	-82.41	6.0	14.2	6.02	-56.19
260.686	-84.67	4.7	14.2	6.02	-59.75

Frequency (MHz)	Corrected Peak Level (dBm)	EIRP(dBm) to EIRP (dBμV/m) Factor	Converted Field Strength Peak Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Result
26.584	-56.19	95.2	39.01	40.0	0.99	Complied
260.686	-59.75	95.2	35.45	46.0	10.55	Complied

Results: 802.11n / HT20 / MCS0 / Port 1 / PWL 26 / CH 149 / 23 dBi Antenna Group



Plot:9 kHz to 30 MHz



Plot:30 MHz to 1 GHz

Note: This plot is a pre-scan and for indication purposes only. For final measurements, see table above.

Result: Pass

Transmitter Conducted Spurious Emissions (continued)

Test Summary:

Test Engineer:	Abdoufataou Salifou	**Test Date:**	31 July 2019
Test Sample Serial Number:	192.168.0.60		
Test Site Identification	SR 9		

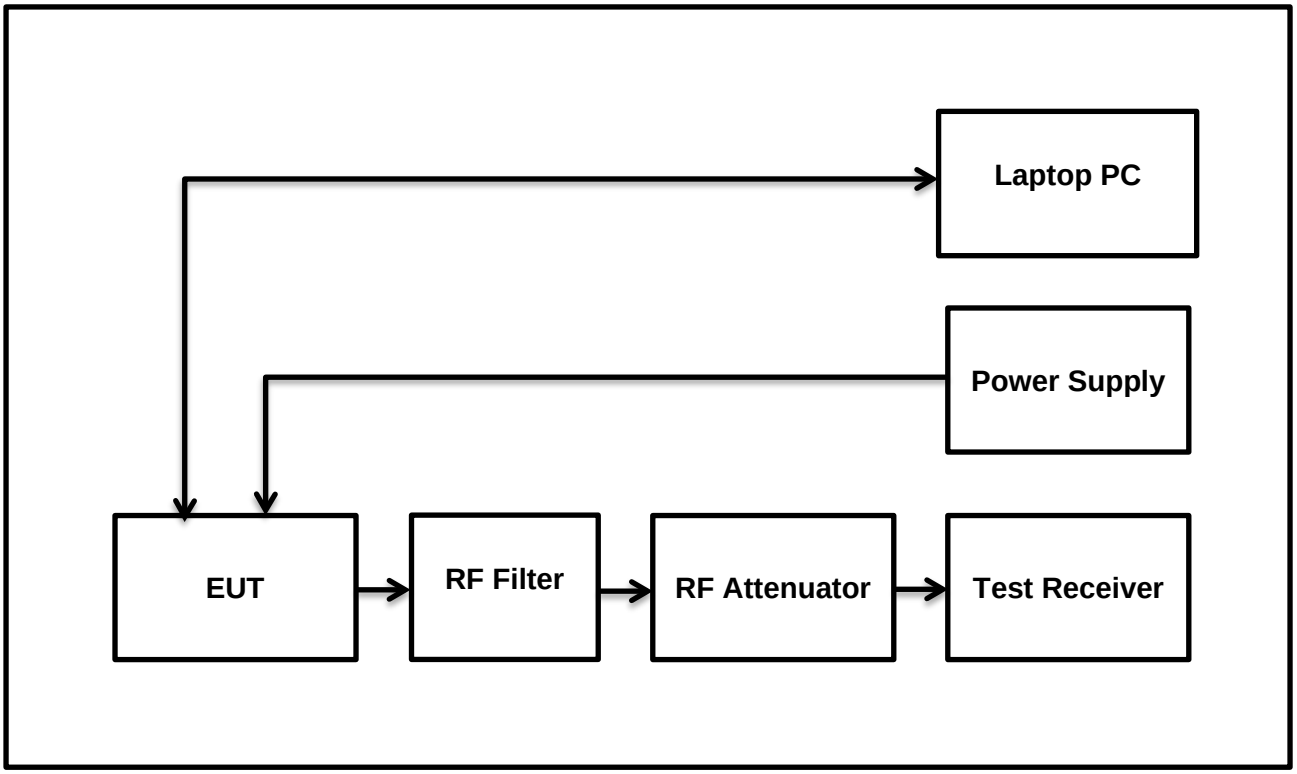
FCC Reference:	Parts 15.407(b)(4),(6),(7) & 15.209(a)
Test Method Used:	FCC KDB 789033 D02 Section II.G.1, II.G.2, II.G.3, II.G.5 & II.G.6 FCC KDB 662911 D01 Section E)3)(iii) referring Section E)2)c)
Frequency Range:	1 GHz to 40 GHz

Environmental Conditions:

Temperature (°C):	23.5
Relative Humidity (%):	43

Notes:

1. According to FCC KDB 789033 D02 Section II.G.3.b) to compliance of Transmitter Cabinet Radited Emissions additional transmitter conducted spurious emissions were performed.
2. Maximum power setting (PWL) amongst all supported SISO & MIMO modes & listed antenna groups has been used.
3. Therefore, transmitter cabinet radiated emissions are valid for all supported Bandwidths, SISO- MIMO modes & listed antenna groups in this report.
4. During initial investigations amongst all supported Bandwidths, SISO & MIMO modes n HT20 SISO mode showed worst case results. Therefore final Transmitter Cabinet Radiated Emissions measurements were performed with the EUT set to the worst case n | SISO mode.
5. The final transmitter conducted spurious emissions were performed with the EUT set to the bottom, middle & top channels.
6. The emissions shown at frequencies approximately 5.7 GHz to 5.9 GHz on the 1 GHz to 10 GHz plots are the EUT fundamental for the given channel.
7. The EUT was configured in following test modes:
   - 8 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26
   - 9 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26
   - 23 dBi Antenna Group: SISO | n Mode | MCS0 | B.W. 20 MHz | PWL 26
8. The RF port on the EUT was connected to the spectrum analyser using suitable attenuation and RF cable. The measured values takes into consideration the external attenuation correction factors. The RF cable attenuation (maximum 2.0 dB at the tested frequencies) from the EUT to Analyzer including the 10 dB attenuation at the Spectrum Analyzer input was added as a reference level offset (12.0 dB) to each of the conducted plots.
9. Pre-scans were performed and markers placed on the highest measured levels. The test receiver resolution bandwidth was set to 1 MHz and video bandwidth 3 MHz. A peak detector was used, sweep time was set to auto and trace mode was Max Hold. A rms detector was used, sweep time was set to auto and trace mode was average for at least 100 traces.
10. The observed emissions levels (in dBm) on SISO Port are reported into the table.
11. Since the EUT was transmitting at <98% duty cycle, the calculated duty cycle correction factor in section 5.2.4 was added to unwanted emissions measured with RMS detector compute the average power during the actual transmission time.
12. According to FCC KDB 789033 D02 Section II.G.1e) a no ground reflection factor is required.

13. Relevant directional Antenna Gain was added for each type of listed Antenna Groups.
14. According to FCC KDB 662911 D01 Section E)3)(iii) referring Section E)2)c); a factor 10 log(N_{ANT}) dB, (where N_{ANT} is the number of outputs) was added. As the EUT has 4 MIMO ports a factor 6.02 dB was added.
15. In accordance with KDB 789033 G.2.d)(iii); transmitter conducted spurious emissions dBm levels have been converted to dBμV/m levels by adding a conversion factor of 95.2.
16. For unwanted emissions measured with Peak detector there are two limit possibilities:
    - According to FCC 15.209 peak limit (above 1 GHz) is 74 dBμV/m (restricted band limit)
    - According to FCC 15.407(b)(4)(i) peak limit is 68.2 dBμV/m (non-restricted band limit)
17. Therefore unwanted emissions in restricted as well non restricted bands, measured with Peak detector lowest limit 68.2 dBμV/m has been applied.

Test Setup: