



Page 63 of 110

10. Conducted Band Edge and Out-of-Band Emissions

10.1 Provisions Applicable

	Applicable to	Limit		
Restricted bands	789033 D02 General UNII Test	Field strength at 3m (dBuV/m)		
	Procedures New Rules v02r01	PK: 74	AV: 54	
	Applicable to	EIRP Limit (dBm/MHz)	Equivalent field Strength at 3m (dBuV/m)	
Out of the	FCC 15.407(b)(1)			
restricted bands	15.407(b)(2)	PK: -27	PK: 68.2	
	15.407(b)(3)			
	15.407(b)(4)		See Note 2	

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

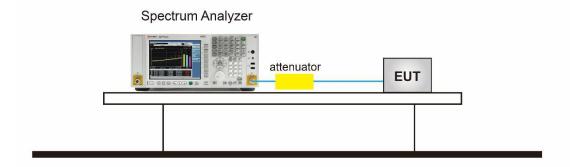
E =
$$\frac{1000000 - \sqrt{30 P}}{3}$$
 µV/m, where P is the eirp (Watts).

Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

10.2 Measurement Procedure

- 1. Connect EUT RF output port to the Spectrum Analyzer through an RF attenuator
- 2. Set the Span = wide enough to capture the peak level of the in-band emission and all spurious emissions from the lowest frequency generated in the EUT up through the 10th harmonic.
- 3. RBW = 1MHz; VBW= 3MHz; Sweep = auto; Detector function = Peak. (Test frequency below 1GHz)
- 4. RBW = 1 MHz; VBW= 3 MHz; Sweep = auto; Detector function = Peak. (Test frequency Above 1GHz)
- 5. Set SPA Trace 1 Max hold, then View.
- 6. Antenna gain and path loss have been compensated to the Correction factor.
- 7. Mark the maximum useless stray point and compare it with the limit value to record the result.

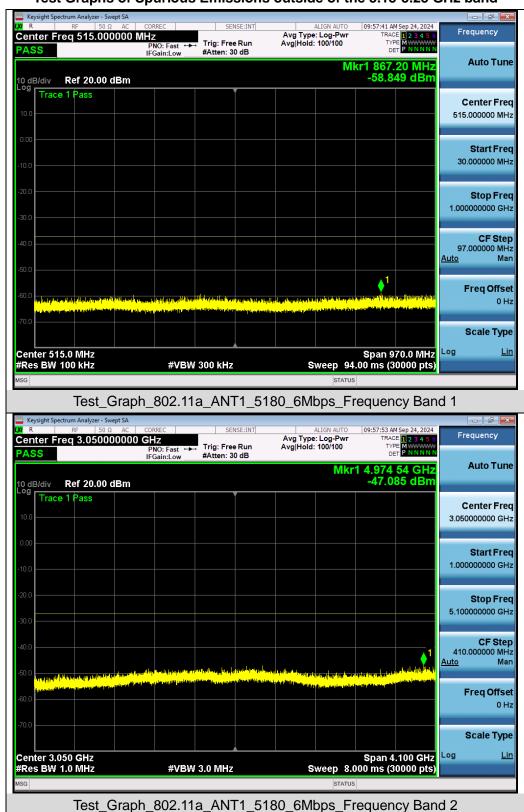
10.3 Measurement Setup (Block Diagram of Configuration)

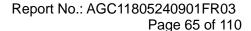




10.4 Measurement Results

Test Graphs of Spurious Emissions outside of the 5.15-5.25 GHz band





CF Step 2.160000000 GHz

Freq Offset 0 Hz

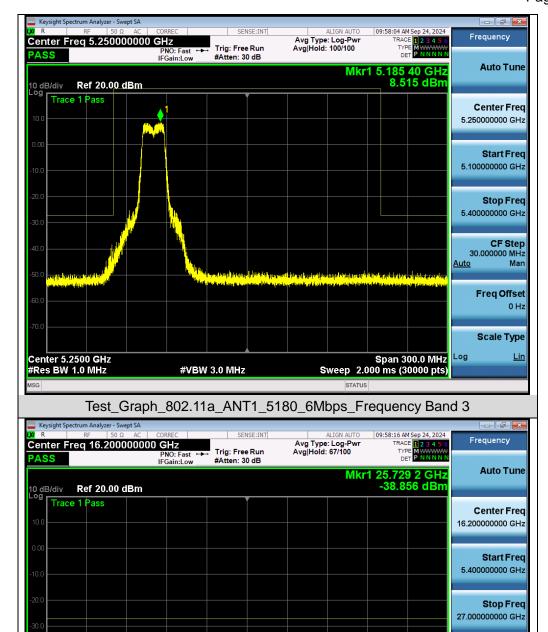
Scale Type

Man

<u>Auto</u>

Span 21.60 GHz Sweep 56.00 ms (30000 pts)



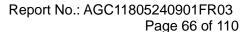


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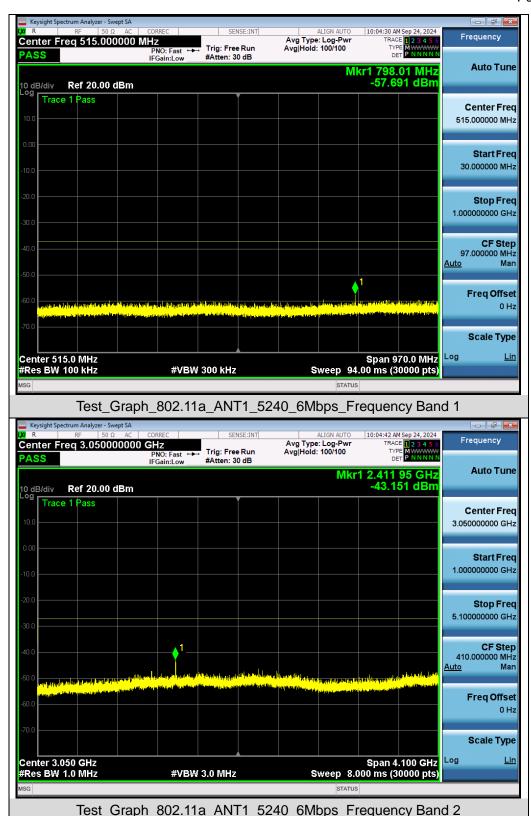
Test Graph 802.11a ANT1 5180 6Mbps Frequency Band 4

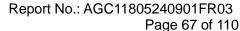
#VBW 3.0 MHz

Center 16.20 GHz #Res BW 1.0 MHz

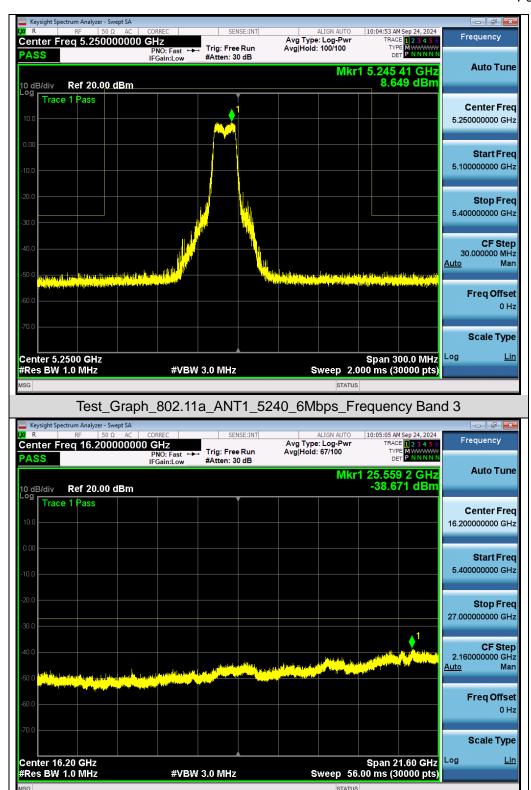




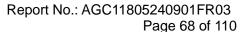




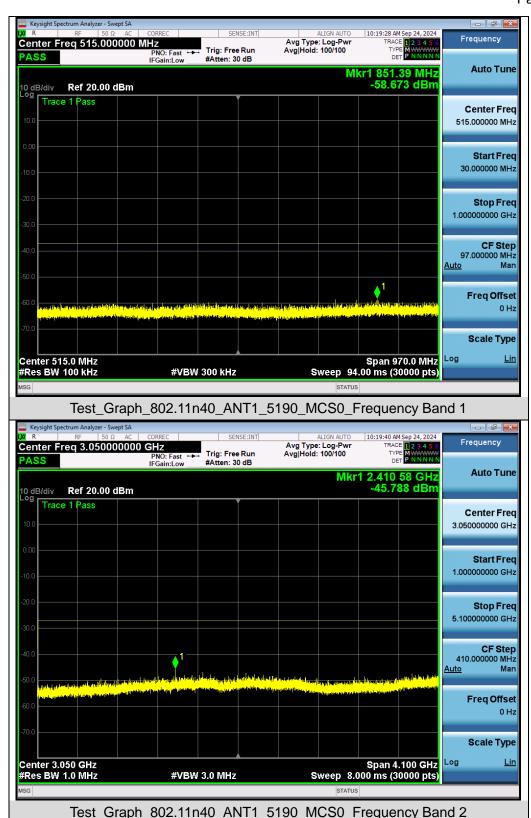


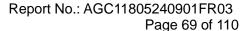


Test Graph 802.11a ANT1 5240 6Mbps Frequency Band 4

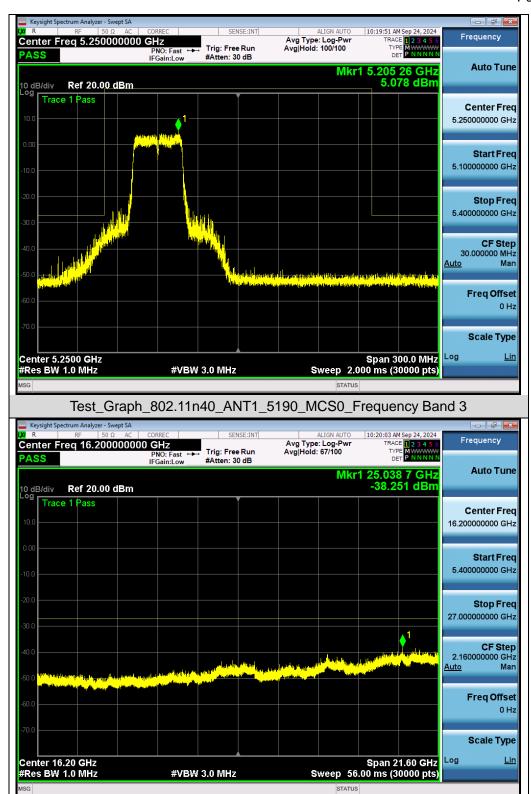




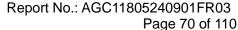




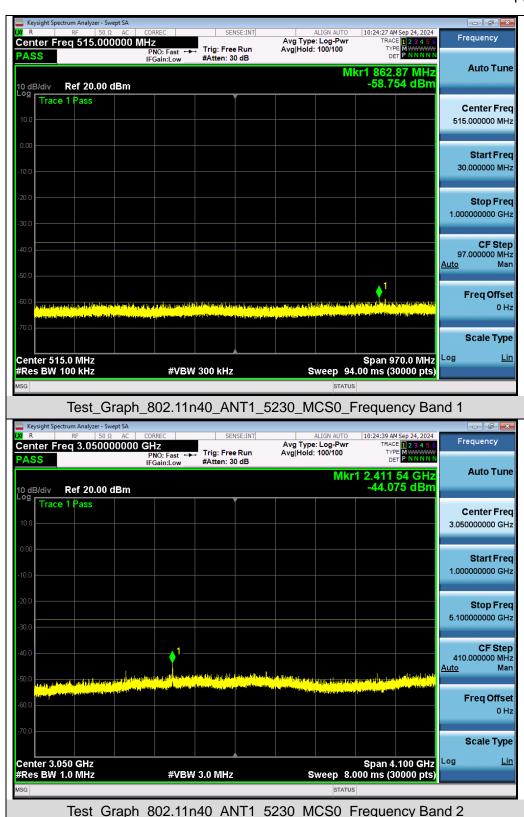


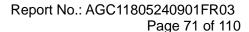


Test Graph 802.11n40 ANT1 5190 MCS0 Frequency Band 4

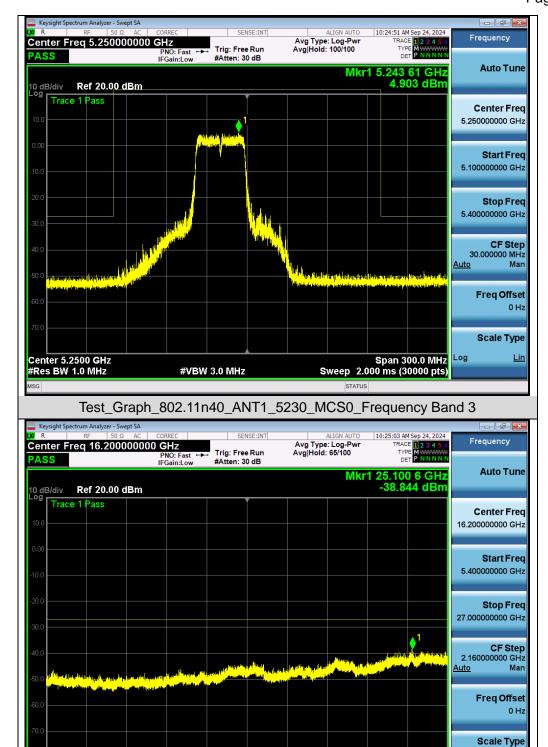










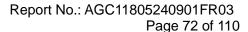


Test Graph 802.11n40 ANT1 5230 MCS0 Frequency Band 4

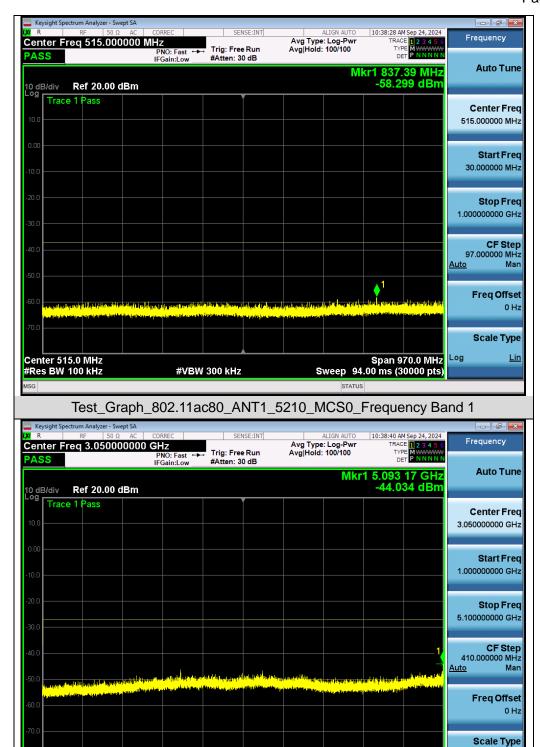
#VBW 3.0 MHz

Span 21.60 GHz Sweep 56.00 ms (30000 pts)

Center 16.20 GHz #Res BW 1.0 MHz





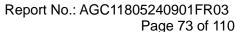


Test Graph 802.11ac80 ANT1 5210 MCS0 Frequency Band 2

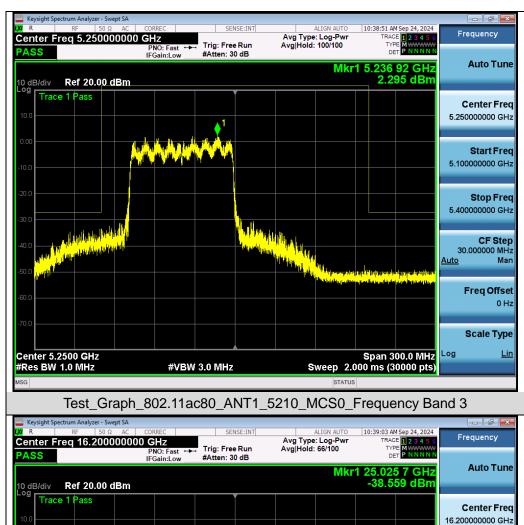
#VBW 3.0 MHz

Span 4.100 GHz Sweep 8.000 ms (30000 pts)

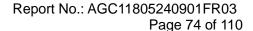
Center 3.050 GHz #Res BW 1.0 MHz





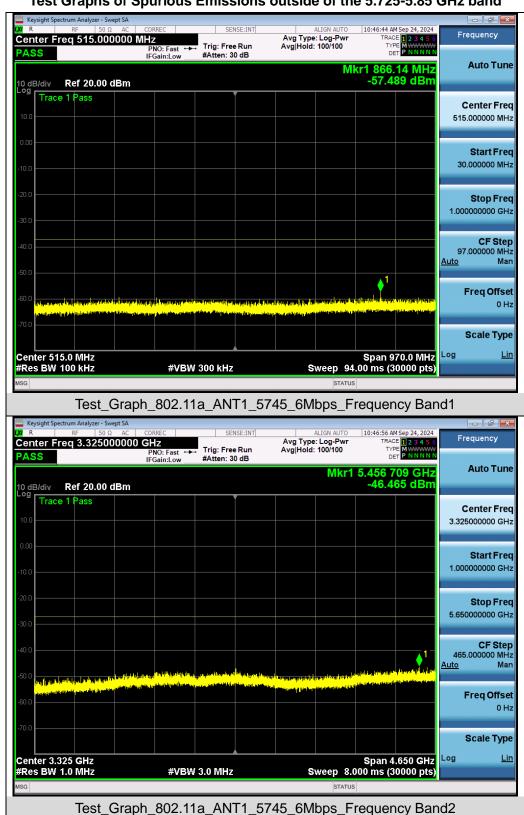


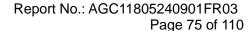






Test Graphs of Spurious Emissions outside of the 5.725-5.85 GHz band



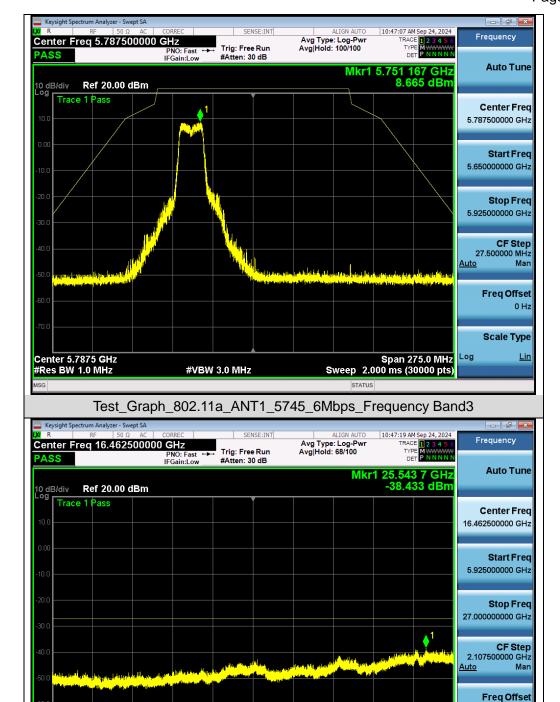


0 Hz

Scale Type

Span 21.08 GHz Sweep 54.00 ms (30000 pts)



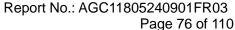


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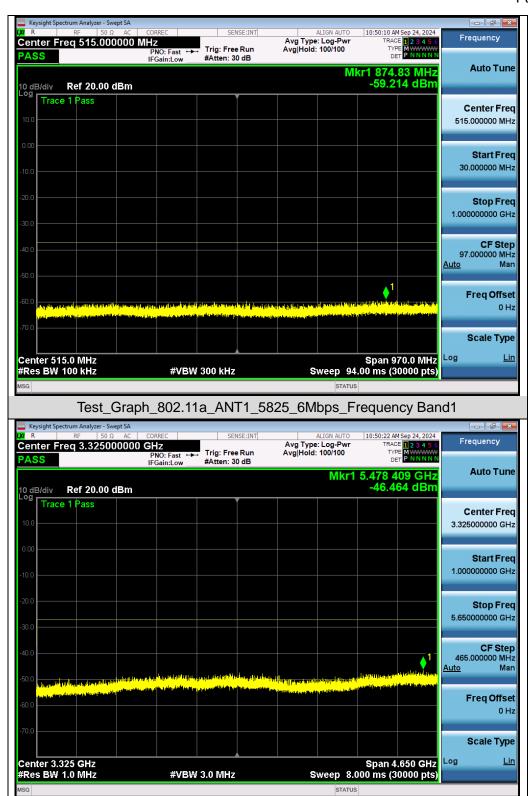
Test Graph 802.11a ANT1 5745 6Mbps Frequency Band4

#VBW 3.0 MHz

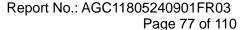
Center 16.46 GHz #Res BW 1.0 MHz



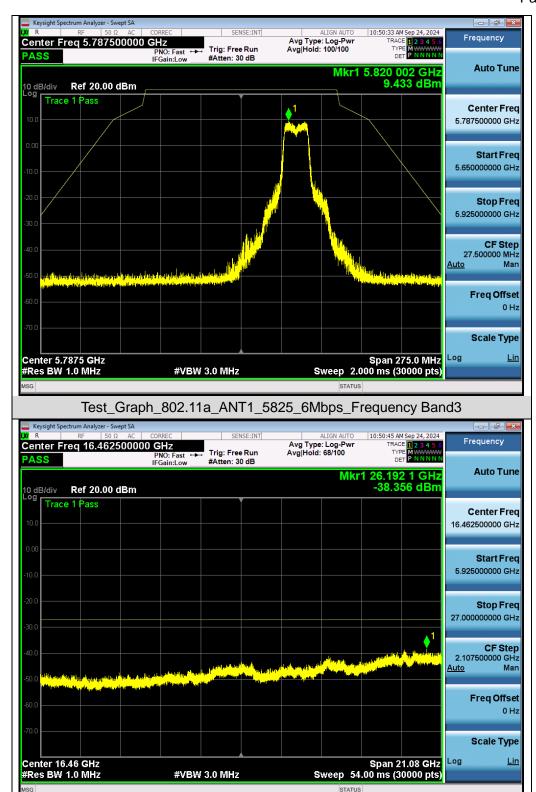




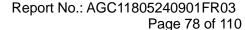
Test Graph 802.11a ANT1 5825 6Mbps Frequency Band2



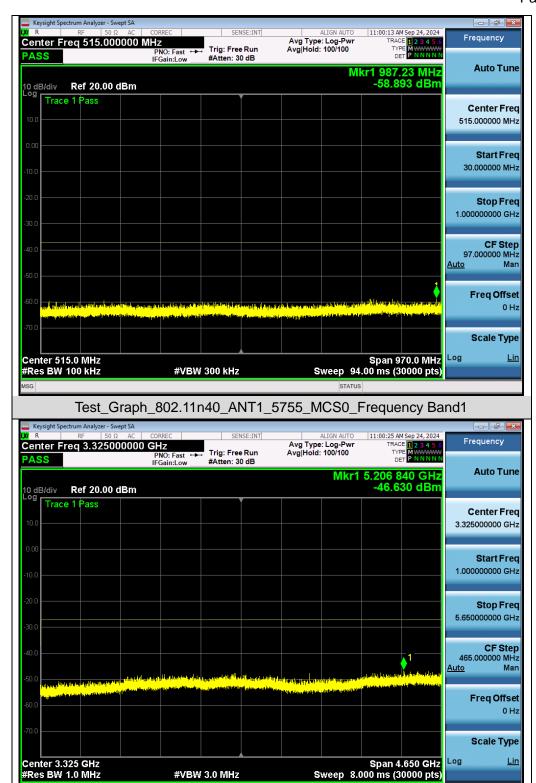




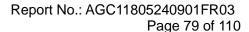
Test Graph 802.11a ANT1 5825 6Mbps Frequency Band4



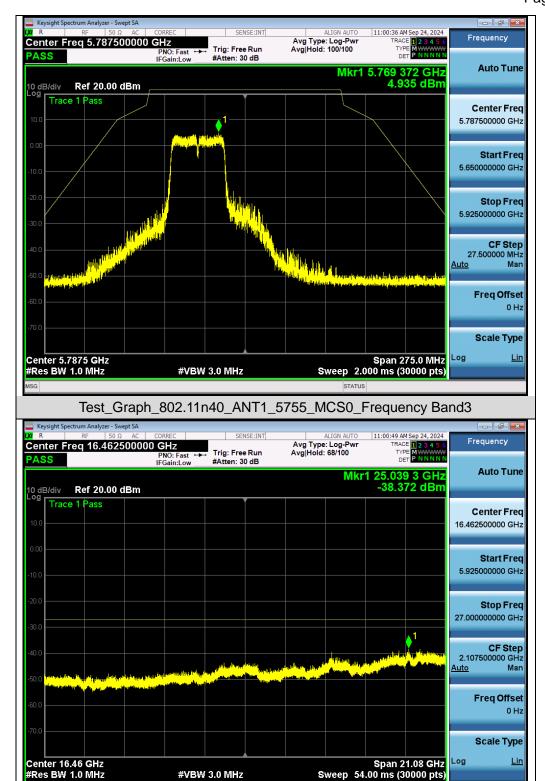




Test Graph 802.11n40 ANT1 5755 MCS0 Frequency Band2

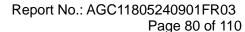




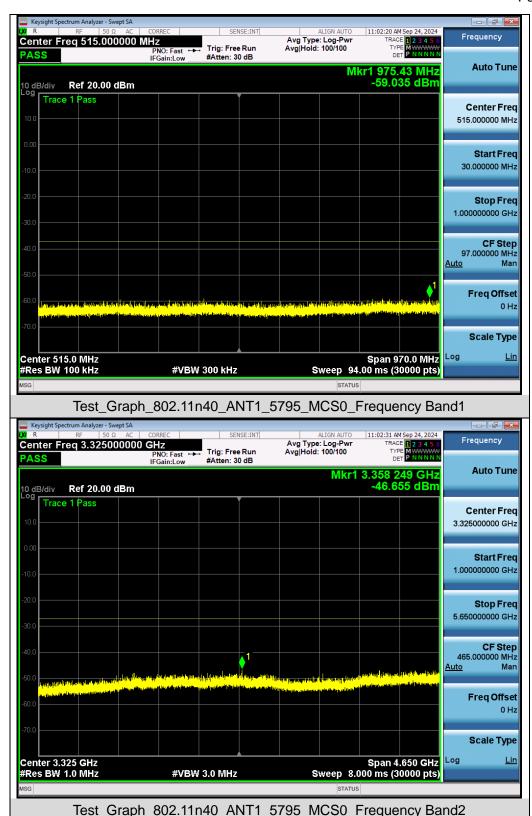


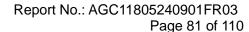
Test Graph 802.11n40 ANT1 5755 MCS0 Frequency Band4

#VBW 3.0 MHz





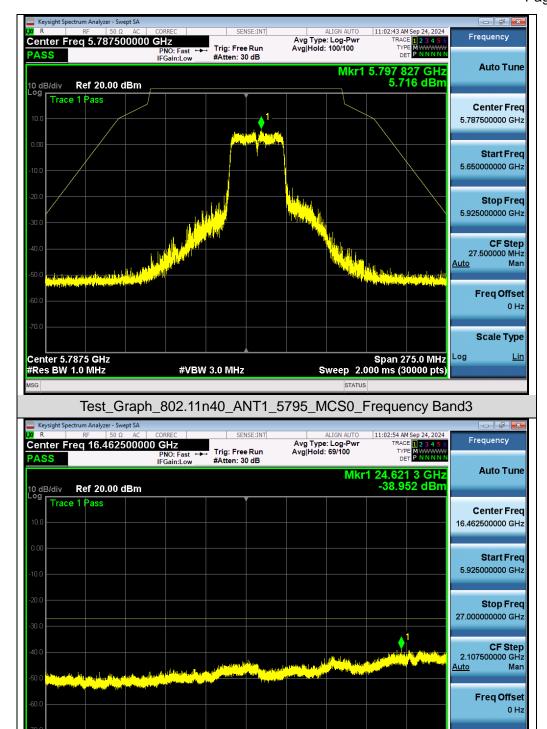




Scale Type

Span 21.08 GHz Sweep 54.00 ms (30000 pts)



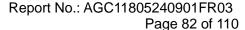


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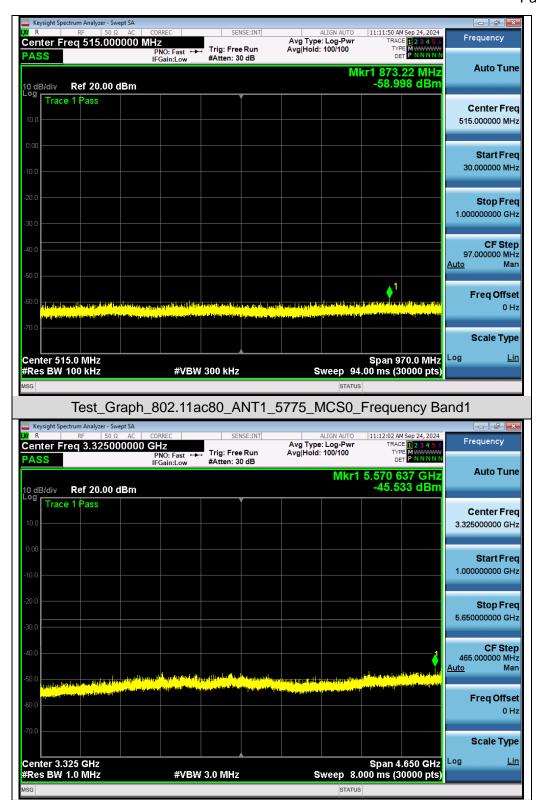
Test Graph 802.11n40 ANT1 5795 MCS0 Frequency Band4

#VBW 3.0 MHz

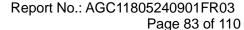
Center 16.46 GHz #Res BW 1.0 MHz



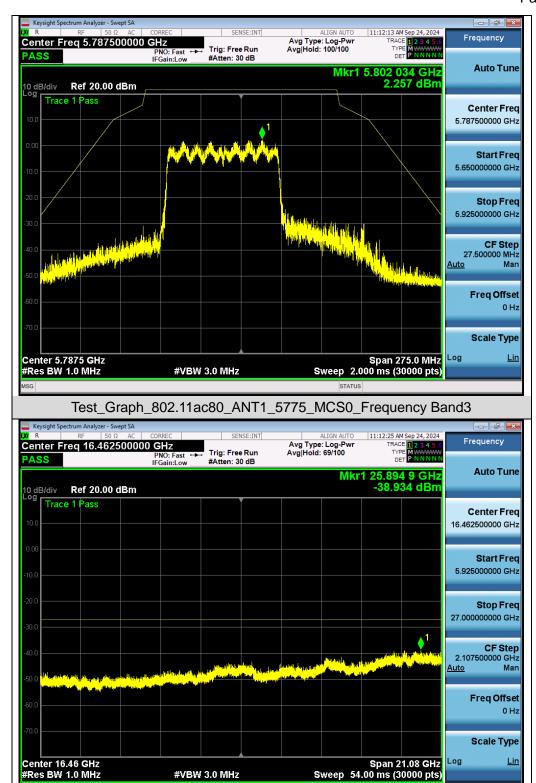




Test Graph 802.11ac80 ANT1 5775 MCS0 Frequency Band2







Test Graph 802.11ac80 ANT1 5775 MCS0 Frequency Band4



Page 84 of 110

11. Radiated Spurious Emission

11.1 Measurement Limit

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

NOTE:

- 1. The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

	Applicable to		Limit	
Restricted	789033 D02 General UNII Test	Field strength at 3m (dBuV/m)		
bands	Procedures New Rules v02r01	PK: 74	AV: 54	
	Applicable to	EIRP Limit (dBm/MHz)	Equivalent field Strength at 3m (dBuV/m)	
Out of the	FCC 15.407(b)(1)			
restricted bands	15.407(b)(2)	PK: -27	PK: 68.2	
	15.407(b)(3)			
	15.407(b)(4)		See Note 2	

Note 1: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

E =
$$\frac{1000000 - \sqrt{30 P}}{3}$$
 µV/m, where P is the eirp (Watts).

Note 2: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.



Page 85 of 110

11.2 Measurement Procedure

- The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
- 2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
- 3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
- 4. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
- 5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
- 6. For emissions above 1GHz, use 1MHz RBW and 3MHz VBW for peak reading. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
- 7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
- 8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
- 9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
- 10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High Low scan is not required in this case.



Page 86 of 110

The following table is the setting of spectrum analyzer and receiver.

Receiver Parameter	Setting
Start ~Stop Frequency	9KHz~150KHz/RB 200Hz for QP
Start ~Stop Frequency	150KHz~30MHz/RB 9KHz for QP
Start ~Stop Frequency	30MHz~1000MHz/RB 120KHz for QP

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.Section G) Unwanted emissions measurement.

◆ Procedure for Unwanted Emissions Measurements Below 1000MHz:

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

♦ Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz:

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

♦ Procedures for Average Unwanted Emissions Measurements Above 1000MHz:

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

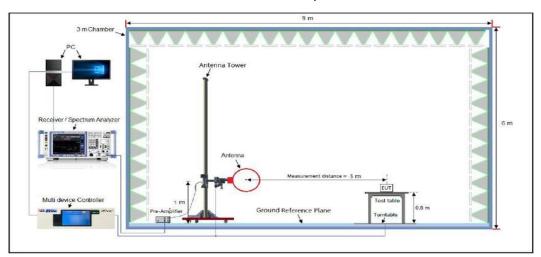
▶ Procedures for Average Unwanted Emissions Measurements Above 1000MHz:

- RBW = 1 MHz
- VBW = 3 MHz Detector = power averaging (rms), set span/(# of points in sweep) ≥ RBW/2.
- Averaging type = power averaging (RMS)
- The correction factor shall be offset is $10 \log (1/x)$, where x is the duty cycle.

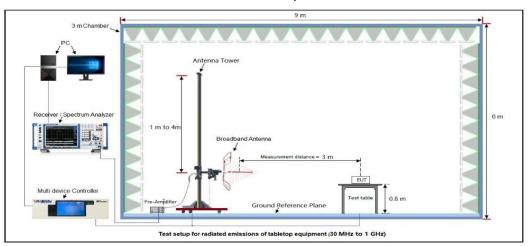


11.3 Measurement Setup (Block Diagram of Configuration)

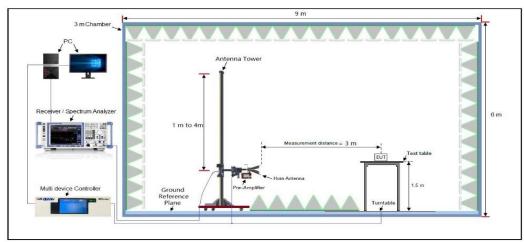
Radiated Emission Test Setup 9kHz-30MHz



Radiated Emission Test Setup 30MHz-1000MHz



Radiated Emission Test Setup Above 1000MHz





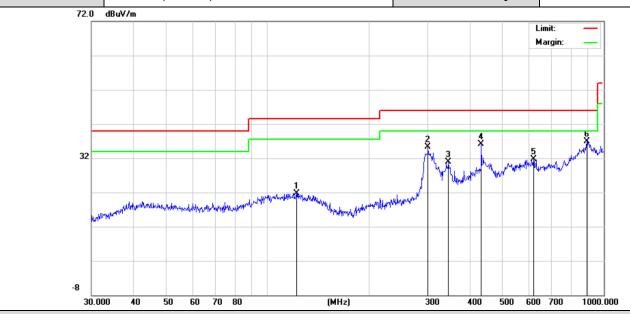
Page 88 of 110

11.4 Measurement Result

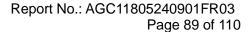
Radiated Emission Below 30MHz

The amplitude of spurious emissions from 9kHz to 30MHz which are attenuated more than 20 dB below the permissible value need not be reported.

Radiated Emission Test Results at 30MHz-1GHz				
EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	22.6℃	Relative Humidity	56.3%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n(20MHz)_5180MHz	Antenna Polarity	Horizontal	

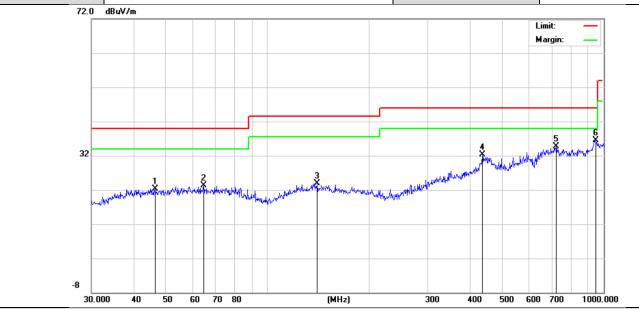


Final I	Final Peak Data List							
NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	121.9755	21.79	16.28	43.50	21.71	100	100	Horizontal
2	300.3672	35.25	16.50	46.00	10.75	100	150	Horizontal
3	345.5952	30.82	17.24	46.00	15.18	100	70	Horizontal
4	432.5457	36.17	23.50	46.00	9.83	100	260	Horizontal
5	618.5369	31.79	25.19	46.00	14.21	100	180	Horizontal
6	890.7278	36.84	30.64	46.00	9.16	100	170	Horizontal



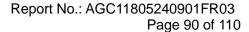


Radiated Emission Test Results at 30MHz-1GHz				
EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	22.6℃	Relative Humidity	56.3%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n(20MHz)_5180MHz	Antenna Polarity	Vertical	



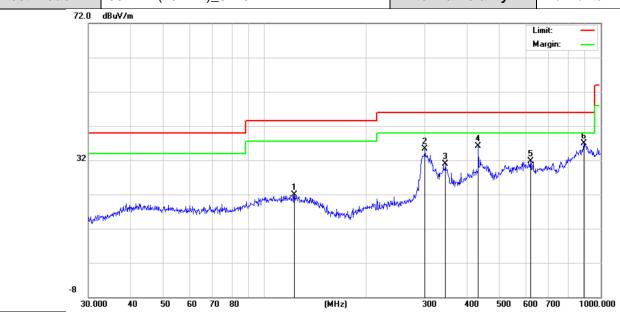
Final Peak Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.3402	22.40	16.96	40.00	17.6	100	140	Vertical
2	64.6594	23.21	17.05	40.00	16.79	100	180	Vertical
3	140.3420	23.85	18.20	43.50	19.65	100	70	Vertical
4	435.5898	32.38	25.39	46.00	13.62	100	220	Vertical
5	721.7259	34.62	28.64	46.00	11.38	100	190	Vertical
6	945.4398	36.47	30.78	46.00	9.53	100	110	Vertical



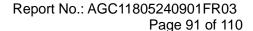


Radiated Emission Test Results at 30MHz-1GHz				
EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	22.6℃	Relative Humidity	56.3%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n(20MHz)_5745MHz	Antenna Polarity	Horizontal	



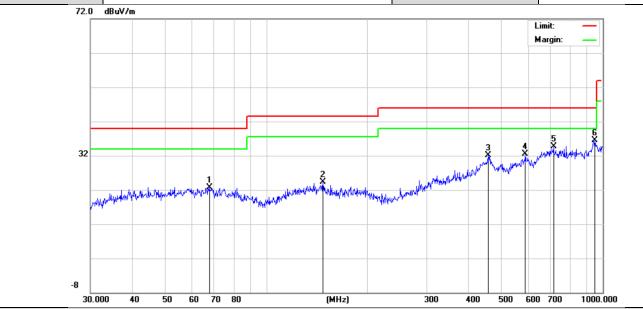
Final Peak Data List

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	122.8340	22.00	16.23	43.50	21.5	100	50	Horizontal
2	300.3672	35.25	16.50	46.00	10.75	100	210	Horizontal
3	345.5951	30.82	17.24	46.00	15.18	100	80	Horizontal
4	432.5457	36.17	23.50	46.00	9.83	100	240	Horizontal
5	618.5368	31.79	25.19	46.00	14.21	100	190	Horizontal
6	890.7278	36.84	30.64	46.00	9.16	100	130	Horizontal





Radiated Emission Test Results at 30MHz-1GHz				
EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	22.6℃	Relative Humidity	56.3%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n(20MHz)_5745MHz	Antenna Polarity	Vertical	



Finai	Peak	Data	List
-------	------	------	------

NO.	Freq. [MHz]	Level [dBµV/m]	Factor [dB]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	67.6751	22.63	17.02	40.00	17.37	100	150	Vertical
2	147.4036	24.25	18.20	43.50	19.25	100	190	Vertical
3	455.9058	32.12	25.38	46.00	13.88	100	60	Vertical
4	588.9051	32.47	25.82	46.00	13.53	100	210	Vertical
5	714.1734	34.72	28.60	46.00	11.28	100	180	Vertical
6	948.7610	36.54	30.65	46.00	9.46	100	10	Vertical

Result: Pass

Note:

- 1. Factor=Antenna Factor + Cable loss, Margin= Limit-Measurement.
- 2. All test modes had been pre-tested, Refer to Chapter 5 of the report for details.



Page 92 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	P8 Neo	
Temperature	23.2°C	Relative Humidity	58.2%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n20_5180MHz	Antenna	Horizontal/Vertical	

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value - Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
10360.000	48.13	9.14	57.27	68.20	-10.93	peak	
15540.000	51.22	10.22	61.44	74.00	-12.56	peak	
15540.000	32.07	10.22	42.29	54.00	-11.71	AVG	
Remark:							

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)		
10360.000	48.96	9.14	58.10	68.20	-10.10	peak	
15540.000	49.31	10.22	59.53	74.00	-14.47	peak	
15540.000	31.07	10.22	41.29	54.00	-12.71	AVG	

Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Result: Pass



Page 93 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	23.2°C	Relative Humidity	58.2%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5200MHz	Antenna	Horizontal/Vertical

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value - Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type
10400.000	48.31	9.14	57.45	68.20	-10.75	peak
15600.000	49.31	10.22	59.53	74.00	-14.47	peak
15600.000	30.01	10.22	40.23	54.00	-13.77	AVG
Remark:						

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	туре
10400.000	48.74	9.14	57.88	68.20	-10.32	peak
15600.000	48.31	10.22	58.53	74.00	-15.47	peak
15600.000	32.01	10.22	42.23	54.00	-11.77	AVG

Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Result: Pass



Page 94 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	23.2°C	Relative Humidity	58.2%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5240MHz	Antenna	Horizontal/Vertical

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value - Type		
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре		
10480.000	48.41	9.27	57.68	68.20	-10.52	peak		
15720.000	50.01	10.38	60.39	74.00	-13.61	peak		
15720.000	31.05	10.38	41.43	54.00	-12.57	AVG		
Remark:								

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
10480.000	46.36	9.27	55.63	68.20	-12.57	peak
15720.000	48.36	10.38	58.74	74.00	-15.26	peak
15720.000	31.01	10.38	41.39	54.00	-12.61	AVG

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Result: Pass



Page 95 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	23.2°C	Relative Humidity	58.2%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5745MHz	Antenna	Horizontal/Vertical

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
11490.000	49.21	9.42	58.63	74.00	-15.37	peak
11490.000	32.05	9.42	41.47	54.00	-12.53	AVG
17235.000	42.36	10.51	52.87	68.20	-15.33	peak
Remark:	·				·	

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	туре
11490.000	49.37	9.42	58.79	74.00	-15.21	peak
11490.000	31.63	9.42	41.05	54.00	-12.95	AVG
17235.000	41.55	10.51	52.06	68.20	-16.14	peak
D I						

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Result: Pass



Page 96 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	23.2°C	Relative Humidity	58.2%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5785MHz	Antenna	Horizontal/Vertical

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	туре
11570.000	49.74	9.42	59.16	74.00	-14.84	peak
11570.000	31.25	9.42	40.67	54.00	-13.33	AVG
17355.000	40.38	10.51	50.89	68.20	-17.31	peak
Remark:						

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value - Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Турс
11570.000	48.79	9.42	58.21	74.00	-15.79	peak
11570.000	30.58	9.42	40.00	54.00	-14.00	AVG
17355.000	42.33	10.51	52.84	68.20	-15.36	peak
			_			

Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Result: Pass



Page 97 of 110

Radiated Emissions Test Results Above 1GHz

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	23.2°C	Relative Humidity	58.2%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5825MHz	Antenna	Horizontal/Vertical

Radiated Emission Above 1GHz-Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value - Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
11650.000	50.11	9.62	59.73	74.00	-14.27	peak
11650.000	34.05	9.62	43.67	54.00	-10.33	AVG
17475.000	39.77	10.75	50.52	68.20	-17.68	peak
Remark:						

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Radiated Emission Above 1GHz-Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Value Type
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	туре
11650.000	49.37	9.62	58.99	74.00	-15.01	peak
11650.000	32.16	9.62	41.78	54.00	-12.22	AVG
17475.000	40.57	10.75	51.32	68.20	-16.88	peak

Remark:

Factor = Antenna Factor + Cable Loss - Pre-amplifier.

Result: Pass

Note:

- 1. The amplitude of other spurious emissions from 1GHz to 40 GHz which are attenuated more than 20 dB below the permissible value need not be reported.
- 2. Factor = Antenna Factor + Cable loss Amplifier gain, Margin=Measure Result-Limit.
- 3. The "Factor" value can be calculated automatically by software of measurement system.
- 4. All test modes had been pre-tested. Refer to Chapter 5 of the report for details.

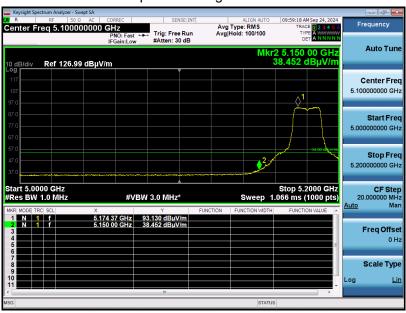


EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5180MHz	Antenna	Horizontal

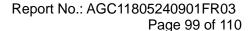
Test Graph for Peak Measurement



Test Graph for Average Measurement



Result: Pass



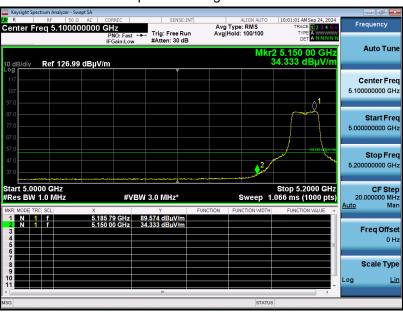


EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n20_5180MHz	Antenna	Vertical	

Test Graph for Peak Measurement



Test Graph for Average Measurement



Result: Pass

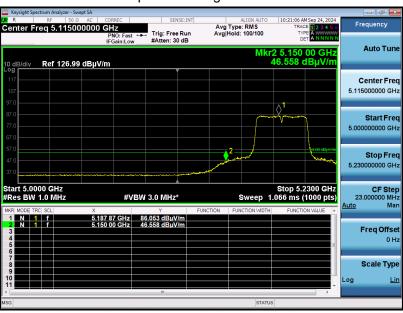


EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n40_5190MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Test Graph for Average Measurement

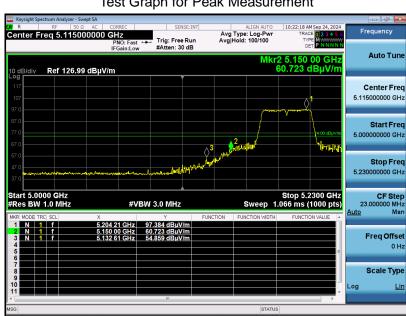


Result: Pass

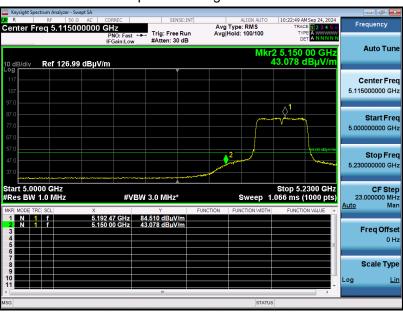


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EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11n40_5190MHz	Antenna	Vertical	

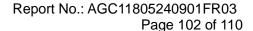
Test Graph for Peak Measurement



Test Graph for Average Measurement



Result: Pass



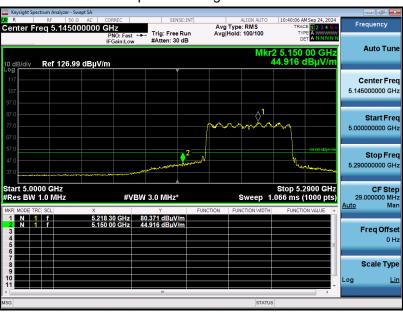


EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11ac80_5210MHz	Antenna	Horizontal	

Test Graph for Peak Measurement



Test Graph for Average Measurement



Result: Pass

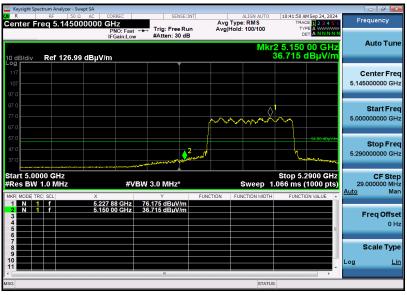


EUT Name	ATOM 2 Drone	Model Name	DSDR23A	
Temperature	25°C	Relative Humidity	55.4%	
Pressure	960hPa	Test Voltage	DC 7.7V	
Test Mode	802.11ac80_5210MHz	Antenna	Vertical	

Test Graph for Peak Measurement



Test Graph for Average Measurement



Result: Pass



Page 104 of 110

Test Result for Band edge Emission at Restricted bands

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5745MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Result: Pass





EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5745MHz	Antenna	Vertical

Test Graph for Peak Measurement



Result: Pass



Report No.: AGC11805240901FR03 Page 106 of 110

Test Result for Band edge Emission at Restricted bands

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5825MHz	Antenna	Horizontal

Test Graph for Peak Measurement



Result: Pass



Page 107 of 110

Test Result for Band edge Emission at Restricted bands

EUT Name	ATOM 2 Drone	Model Name	DSDR23A
Temperature	25°C	Relative Humidity	55.4%
Pressure	960hPa	Test Voltage	DC 7.7V
Test Mode	802.11n20_5825MHz	Antenna	Vertical

Test Graph for Peak Measurement



Result: Pass

Note:

- 1. The factor had been edited in the "Input Correction" of the Spectrum Analyzer.
- 2. All test modes had been pre-tested, Refer to Chapter 5 of the report for details.



Page 108 of 110

12. AC Power Line Conducted Emission Test

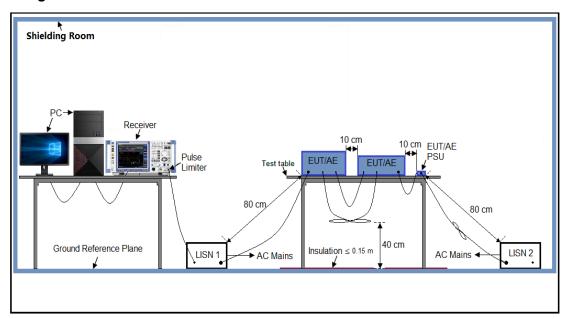
12.1 Measurement limit

Francisco	Maximum RF Line Voltage		
Frequency	Q.P (dBµV)	Average (dBµV)	
150kHz~500kHz	66-56	56-46	
500kHz~5MHz	56	46	
5MHz~30MHz	60	50	

Note:

- 1. The lower limit shall apply at the transition frequency.
- 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50MHz.

12.2 Block Diagram of Line Conducted Emission Test





Page 109 of 110

12.3 Preliminary Procedure of Line Conducted Emission Test

- 1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor-standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- 2. Support equipment, if needed, was placed as per ANSI C63.10.
- 3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4. All support equipment received AC120V/60Hz power from a LISN, if any.
- 5. The EUT received charging voltage by adapter which received 120V/60Hzpower by a LISN.
- 6. The test program was started. Emissions were measured on each current carrying line of the EUT using spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 Ohm load; the second scan had Line 1 connected to a 50 Ohm load and Line 2 connected to the Analyzer / Receiver.
- 7. Analyzer / Receiver scanned from 150 kHz to 30MHz for emissions in each of the test modes.
- 8. During the above scans, the emissions were maximized by cable manipulation.
- 9. The test mode(s) were scanned during the preliminary test.

Then, the EUT configuration and cable configuration of the above highest emission level were recorded for reference of final testing.

12.4 Final Procedure of Line Conducted Emission Test

- 1. EUT and support equipment was set up on the test bench as per step 2 of the preliminary test.
- 2. A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit. If EUT emission level was less 2dB to the A.V. limit in Peak mode, then the emission signal was re-checked using Q.P and Average detector.
- 3. The test data of the worst case was reported on the Summary Data page.
- 4. The worst mode is 802.11n20 5180MHz, antenna 1 and antenna 2 work together.

12.5 Test Result of Line Conducted Emission Test

N/A

Note: The 5GWIFI function cannot transmit when charging



Page 110 of 110

Appendix I: Photographs of Test Setup

Refer to the Report No.: AGC11805240901AP01

Appendix II: Photographs of EUT

Refer to the Report No.: AGC11805240901AP02

----End of Report----



Conditions of Issuance of Test Reports

- 1. All samples and goods are accepted by the Attestation of Global Compliance (Shenzhen) Co., Ltd (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the company and any person, firm or company requesting its services (the "Clients").
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- 3. The Company shall not be called or be liable to be called to give evidence or testimony on the Report in a court of law without its prior written consent, unless required by the relevant governmental authorities, laws or court orders.
- 4. In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
- 5. Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
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- 8. The Company is not responsible for recalling the electronic version of the original report when any revision is made to them. The Client assumes the responsibility to providing the revised version to any interested party who uses them.
- 9. Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of six years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.