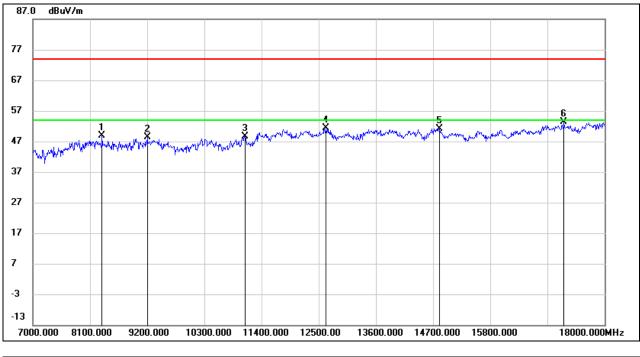


## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8331.000	39.20	9.58	48.78	74.00	-25.22	peak
2	9200.000	38.43	9.91	48.34	74.00	-25.66	peak
3	11081.000	34.92	13.70	48.62	74.00	-25.38	peak
4	12643.000	35.62	15.71	51.33	74.00	-22.67	peak
5	14821.000	33.24	17.90	51.14	74.00	-22.86	peak
6	17219.000	31.15	22.11	53.26	74.00	-20.74	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

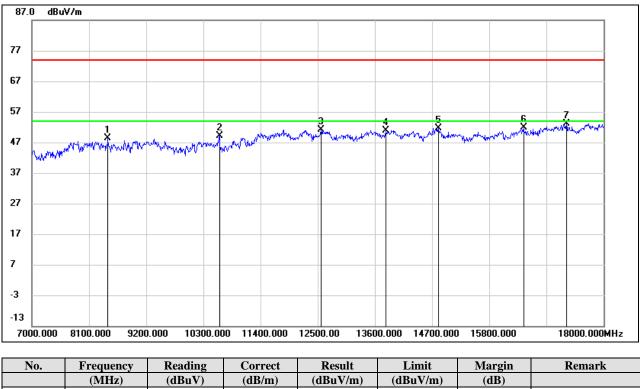
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### UNII-2A BAND

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8463.000	39.20	9.20	48.40	74.00	-25.60	peak
2	10608.000	36.49	12.70	49.19	74.00	-24.81	peak
3	12566.000	35.44	15.74	51.18	74.00	-22.82	peak
4	13809.000	33.35	17.60	50.95	74.00	-23.05	peak
5	14821.000	33.79	17.90	51.69	74.00	-22.31	peak
6	16460.000	32.14	19.69	51.83	74.00	-22.17	peak
7	17285.000	30.62	22.52	53.14	74.00	-20.86	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

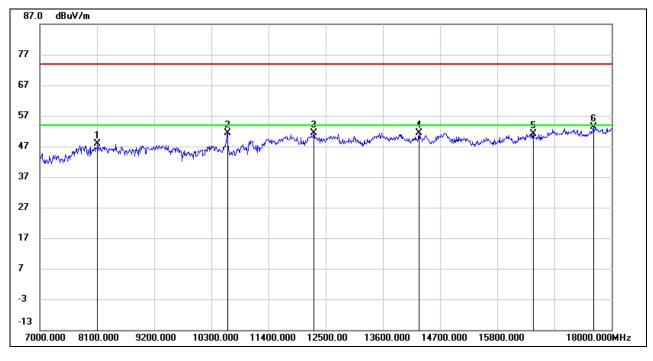
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands are lower than the line(54dBuV/m) in the graph, so all the peak test point was deemed to comply with the limits -27dBm/MHz (68.2dBuV/m) list in the standard CFR 47 FCC §15.407 (b) and ISED RSS-247 6.2.



## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8111.000	37.66	10.14	47.80	74.00	-26.20	peak
2	10608.000	38.58	12.70	51.28	74.00	-22.72	peak
3	12269.000	35.25	16.04	51.29	74.00	-22.71	peak
4	14293.000	33.33	18.10	51.43	74.00	-22.57	peak
5	16493.000	31.49	19.69	51.18	74.00	-22.82	peak
6	17659.000	30.09	23.17	53.26	74.00	-20.74	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

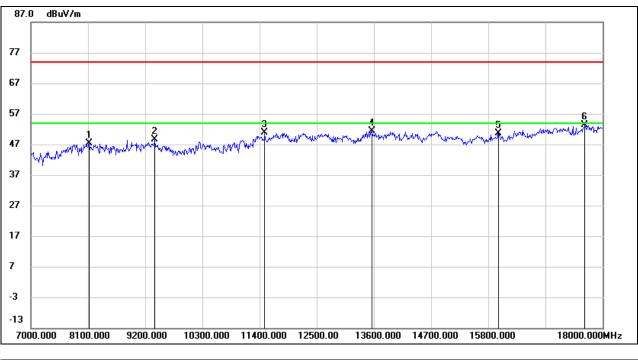
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### UNII-2C BAND

## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8122.000	37.35	10.10	47.45	74.00	-26.55	peak
2	9387.000	37.77	10.89	48.66	74.00	-25.34	peak
3	11499.000	36.29	14.65	50.94	74.00	-23.06	peak
4	13567.000	34.18	17.14	51.32	74.00	-22.68	peak
5	15998.000	32.26	18.42	50.68	74.00	-23.32	peak
6	17659.000	30.15	23.17	53.32	74.00	-20.68	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

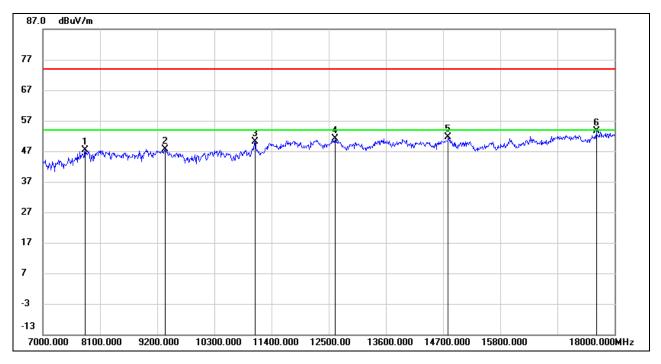
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands are lower than the line(54dBuV/m) in the graph, so all the peak test point was deemed to comply with the limits -27dBm/MHz (68.2dBuV/m) list in the standard CFR 47 FCC §15.407 (b) and ISED RSS-247 6.2.



#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	7814.000	38.05	9.28	47.33	74.00	-26.67	peak
2	9354.000	37.00	10.70	47.70	74.00	-26.30	peak
3	11081.000	36.39	13.70	50.09	74.00	-23.91	peak
4	12621.000	35.41	15.75	51.16	74.00	-22.84	peak
5	14799.000	33.66	18.04	51.70	74.00	-22.30	peak
6	17648.000	30.57	23.08	53.65	74.00	-20.35	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

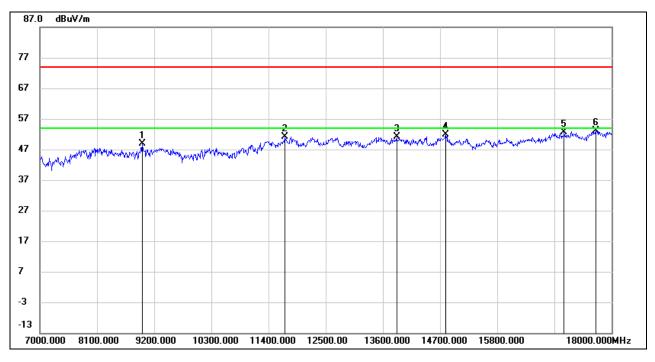
3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8969.000	38.15	10.69	48.84	74.00	-25.16	peak
2	11708.000	35.85	15.34	51.19	74.00	-22.81	peak
3	13864.000	33.63	17.55	51.18	74.00	-22.82	peak
4	14810.000	33.86	17.97	51.83	74.00	-22.17	peak
5	17087.000	30.80	21.81	52.61	74.00	-21.39	peak
6	17692.000	29.80	23.41	53.21	74.00	-20.79	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

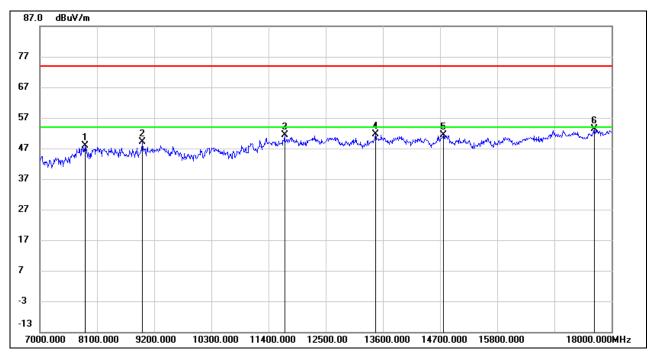
3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	7869.000	38.79	9.02	47.81	74.00	-26.19	peak
2	8969.000	38.47	10.69	49.16	74.00	-24.84	peak
3	11708.000	35.98	15.34	51.32	74.00	-22.68	peak
4	13457.000	34.46	17.14	51.60	74.00	-22.40	peak
5	14766.000	33.48	17.92	51.40	74.00	-22.60	peak
6	17670.000	30.10	23.24	53.34	74.00	-20.66	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

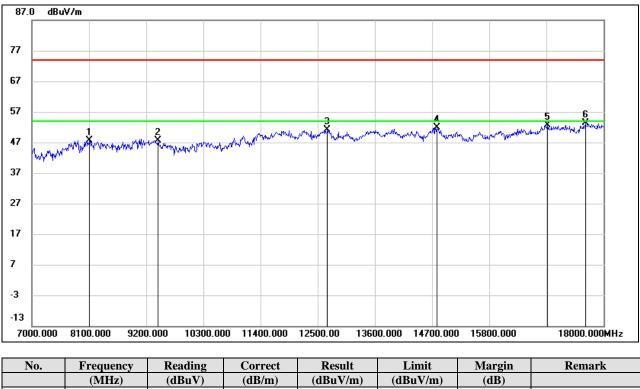
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## **STRADDLE CHANNEL 138**

## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8111.000	37.51	10.14	47.65	74.00	-26.35	peak
2	9431.000	36.77	10.83	47.60	74.00	-26.40	peak
3	12687.000	35.39	15.64	51.03	74.00	-22.97	peak
4	14799.000	33.72	18.04	51.76	74.00	-22.24	peak
5	16922.000	31.17	21.49	52.66	74.00	-21.34	peak
6	17648.000	30.42	23.08	53.50	74.00	-20.50	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

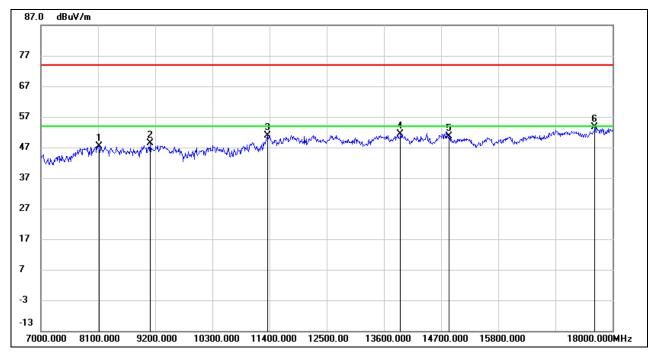
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands are lower than the line(54dBuV/m) in the graph, so all the peak test point was deemed to comply with the limits -27dBm/MHz (68.2dBuV/m) list in the standard CFR 47 FCC §15.407 (b) and ISED RSS-247 6.2.



## HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	8122.000	37.33	10.10	47.43	74.00	-26.57	peak
2	9101.000	38.31	10.14	48.45	74.00	-25.55	peak
3	11367.000	36.44	14.45	50.89	74.00	-23.11	peak
4	13919.000	33.80	17.55	51.35	74.00	-22.65	peak
5	14854.000	33.05	17.69	50.74	74.00	-23.26	peak
6	17659.000	30.45	23.17	53.62	74.00	-20.38	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

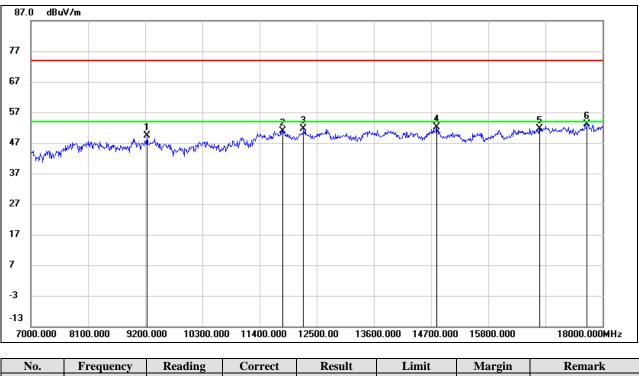
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



#### UNII-3 BAND

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	9233.000	39.38	10.08	49.46	74.00	-24.54	peak
2	11840.000	35.55	15.35	50.90	74.00	-23.10	peak
3	12247.000	35.51	16.02	51.53	74.00	-22.47	peak
4	14810.000	34.04	17.97	52.01	74.00	-21.99	peak
5	16790.000	31.08	20.64	51.72	74.00	-22.28	peak
6	17703.000	29.68	23.49	53.17	74.00	-20.83	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

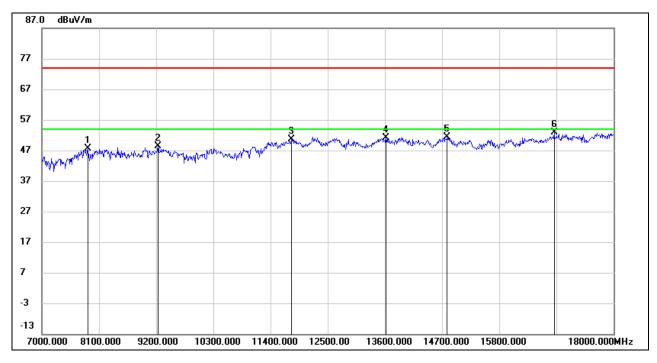
4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

6. Owing to the highest peak level of unwanted emission out of the restricted bands are lower than the line(54dBuV/m) in the graph, so all the peak test point was deemed to comply with the limits -27dBm/MHz (68.2dBuV/m) list in the standard CFR 47 FCC §15.407 (b) and ISED RSS-247 6.2.



## HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	7880.000	38.68	8.95	47.63	74.00	-26.37	peak
2	9233.000	38.42	10.08	48.50	74.00	-25.50	peak
3	11807.000	35.34	15.27	50.61	74.00	-23.39	peak
4	13622.000	33.98	17.20	51.18	74.00	-22.82	peak
5	14799.000	33.23	18.04	51.27	74.00	-22.73	peak
6	16856.000	31.61	21.19	52.80	74.00	-21.20	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.

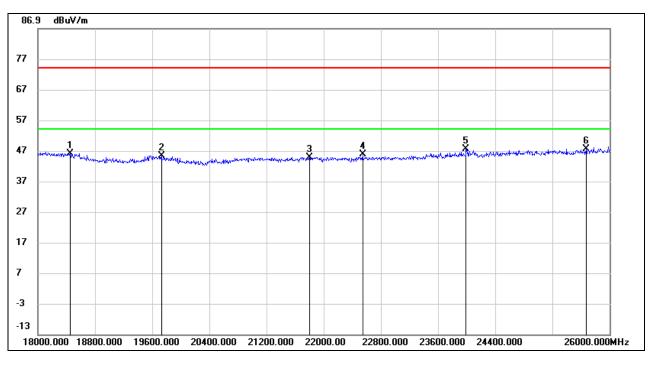
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.



## 8.4. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

## 8.4.1. 802. 11a 20 SISO MODE

#### ANTENNA 1 SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, HORIZONTAL, WORST-CASE CONFIGURATION)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	18456.000	50.43	-4.38	46.05	74.00	-27.95	peak
2	19728.000	49.65	-4.38	45.27	74.00	-28.73	peak
3	21800.000	50.74	-5.86	44.88	74.00	-29.12	peak
4	22544.000	51.48	-5.79	45.69	74.00	-28.31	peak
5	23992.000	51.66	-4.03	47.63	74.00	-26.37	peak
6	25672.000	49.10	-1.48	47.62	74.00	-26.38	peak

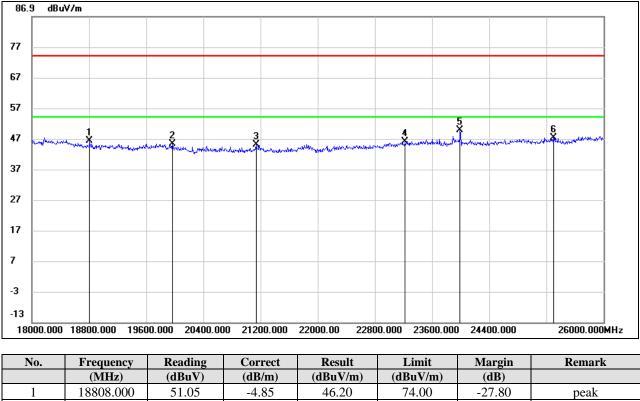
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.



## SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



	(MHZ)	(abuv)	( <b>a</b> B/m)	(aBuv/m)	(dBuV/m)	(ab)	
1	18808.000	51.05	-4.85	46.20	74.00	-27.80	peak
2	19968.000	49.73	-4.36	45.37	74.00	-28.63	peak
3	21136.000	50.36	-5.41	44.95	74.00	-29.05	peak
4	23224.000	51.35	-5.29	46.06	74.00	-27.94	peak
5	23992.000	53.72	-4.03	49.69	74.00	-24.31	peak
6	25296.000	48.70	-1.30	47.40	74.00	-26.60	peak

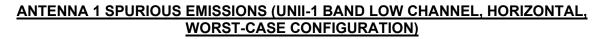
Note: 1. Measurement = Reading Level + Correct Factor.

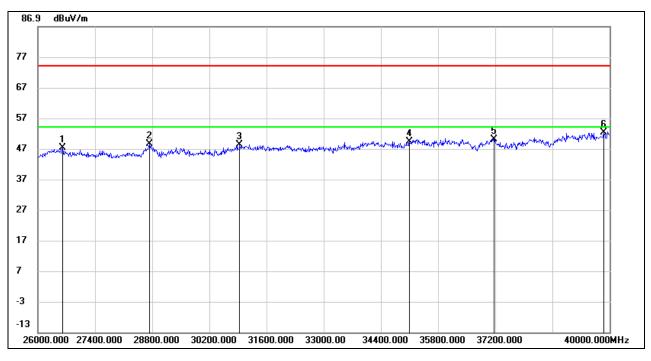
If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
Peak: Peak detector.

Note: All the modes, antennas and channels had been tested, but only the worst data was recorded in the report.

## 8.5. SPURIOUS EMISSIONS (26 GHz ~ 40 GHz)

## 8.5.1. 802. 11a 20 SISO MODE





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	26602.000	52.09	-4.80	47.29	74.00	-26.71	peak
2	28730.000	49.22	-0.69	48.53	74.00	-25.47	peak
3	30942.000	49.06	-0.81	48.25	74.00	-25.75	peak
4	35100.000	47.49	1.85	49.34	74.00	-24.66	peak
5	37172.000	46.99	3.16	50.15	74.00	-23.85	peak
6	39860.000	47.37	4.97	52.34	74.00	-21.66	peak

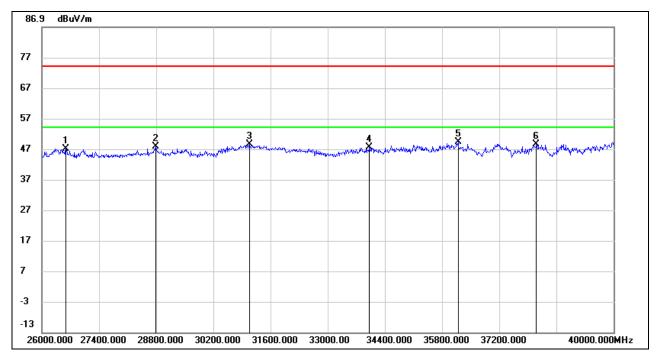
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.



#### SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	26588.000	51.92	-4.80	47.12	74.00	-26.88	peak
2	28786.000	48.30	-0.64	47.66	74.00	-26.34	peak
3	31082.000	49.29	-0.74	48.55	74.00	-25.45	peak
4	34022.000	46.53	1.11	47.64	74.00	-26.36	peak
5	36192.000	45.86	3.43	49.29	74.00	-24.71	peak
6	38110.000	45.07	3.53	48.60	74.00	-25.40	peak

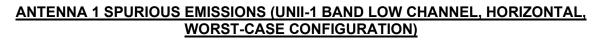
Note: 1. Measurement = Reading Level + Correct Factor.

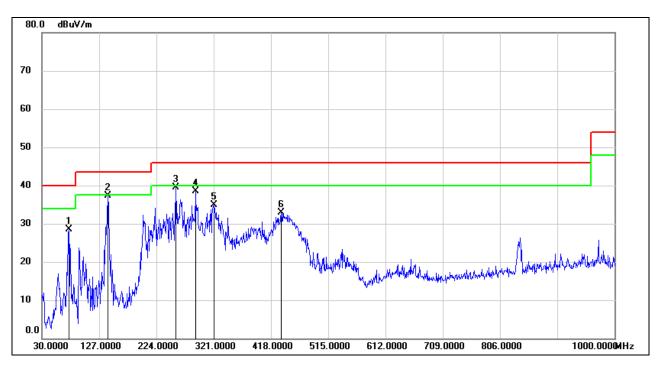
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit. 3. Peak: Peak detector.

Note: All the modes, antennas and channels had been tested, but only the worst data was recorded in the report.

## 8.6. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

## 8.6.1. 802. 11a 20 SISO MODE





No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	75.5899	49.44	-20.99	28.45	40.00	-11.55	QP
2	141.5500	56.02	-18.76	37.26	43.50	-6.24	QP
3	256.9800	58.25	-18.67	39.58	46.00	-6.42	QP
4	289.9600	54.37	-15.91	38.46	46.00	-7.54	QP
5	321.0000	49.78	-14.78	35.00	46.00	-11.00	QP
6	435.4600	45.51	-12.64	32.87	46.00	-13.13	QP

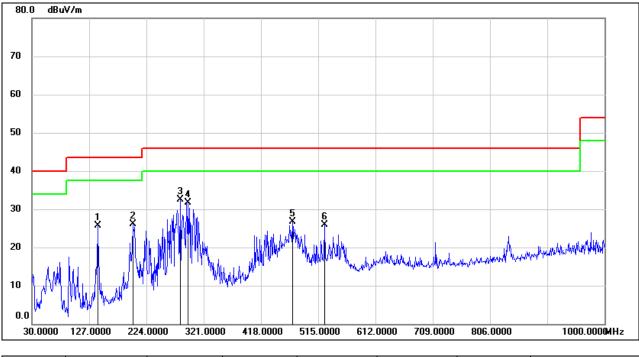
Note: 1. Result Level = Read Level + Correct Factor.

- 2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
- 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.



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#### SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, VERTICAL, WORST-CASE CONFIGURATION)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> / <b>m</b> )	(dBuV/m)	(dBuV/m)	( <b>dB</b> )	
1	141.5500	44.42	-18.76	25.66	43.50	-17.84	QP
2	200.7200	42.46	-16.44	26.02	43.50	-17.48	QP
3	281.2300	49.13	-16.59	32.54	46.00	-13.46	QP
4	294.8100	47.40	-15.61	31.79	46.00	-14.21	QP
5	471.3500	38.76	-12.00	26.76	46.00	-19.24	QP
6	525.6700	36.87	-10.93	25.94	46.00	-20.06	QP

Note: 1. Result Level = Read Level + Correct Factor.

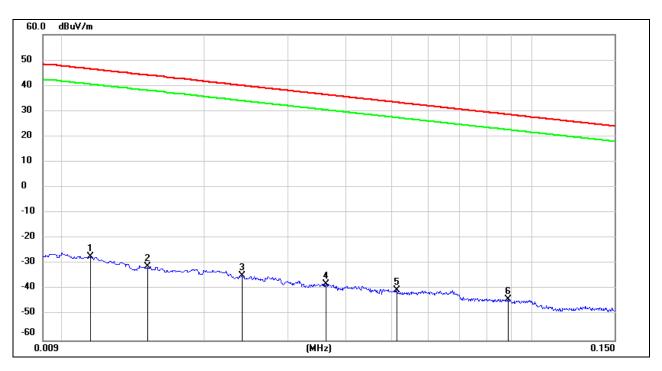
If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the modes, antennas and channels had been tested, but only the worst data was recorded in the report.

## 8.7. SPURIOUS EMISSIONS BELOW 30 MHz

## 8.7.1. 802. 11a 20 SISO MODE

ANTENNA 1 SPURIOUS EMISSIONS (UNII-1 BAND LOW CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)



#### <u>9 kHz~ 150 kHz</u>

No.	Frequency	Reading	Correct	FCC Result	FCC Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0114	74.38	-101.40	-27.02	46.46	-73.48	peak
2	0.0151	70.21	-101.37	-31.16	44.02	-75.18	peak
3	0.0240	66.82	-101.36	-34.54	40	-74.54	peak
4	0.0362	63.51	-101.42	-37.91	36.43	-74.34	peak
5	0.0514	61.18	-101.48	-40.3	33.38	-73.68	peak
6	0.0889	57.77	-101.71	-43.94	28.63	-72.57	peak

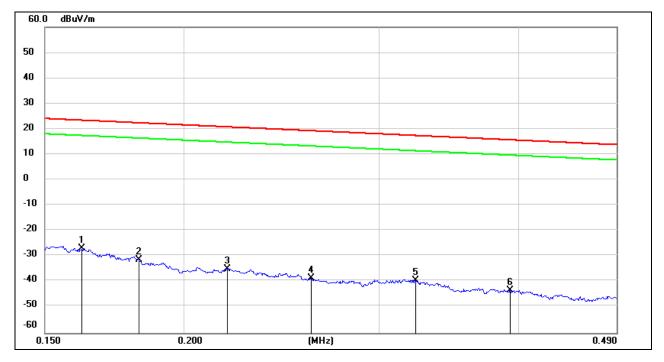
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



#### <u>150 kHz ~ 490 kHz</u>



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1621	74.92	-101.65	-26.73	23.41	-50.14	peak
2	0.1824	70.34	-101.68	-31.34	22.38	-53.72	peak
3	0.2190	66.77	-101.75	-34.98	20.79	-55.77	peak
4	0.2605	63.14	-101.81	-38.67	19.28	-57.95	peak
5	0.3234	62.48	-101.88	-39.4	17.41	-56.81	peak
6	0.3933	58.72	-101.96	-43.24	15.71	-58.95	peak

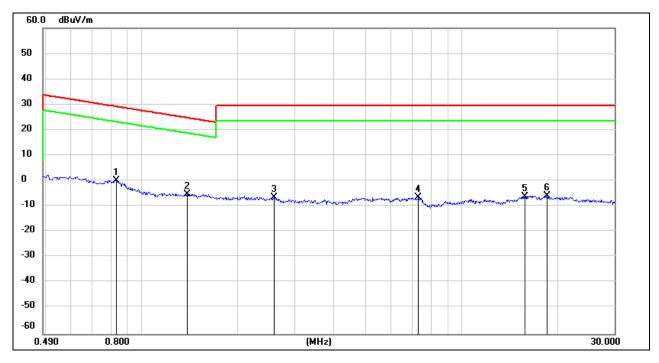
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



#### <u>490 kHz ~ 30 MHz</u>



No.	Frequency	Reading	Correct	FCC Result	FCC Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.8296	62.44	-62.17	0.27	29.23	-28.96	peak
2	1.3810	56.97	-62.10	-5.13	24.8	-29.93	peak
3	2.5935	55.11	-61.68	-6.57	29.54	-36.11	peak
4	7.3361	54.58	-61.17	-6.59	29.54	-36.13	peak
5	15.7759	54.75	-60.99	-6.24	29.54	-35.78	peak
6	18.4908	55.06	-60.89	-5.83	29.54	-35.37	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Note: All the modes, antennas and channels had been tested, but only the worst data was recorded in the report.



# 9. AC POWER LINE CONDUCTED EMISSIONS

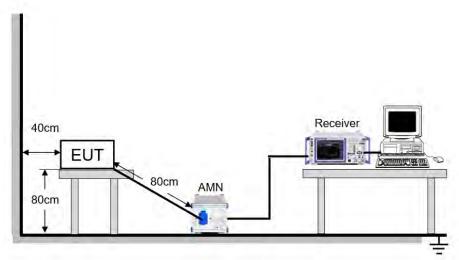
## LIMITS

Please refer to CFR 47 FCC §15.207 (a)

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

#### TEST SETUP AND PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.



The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

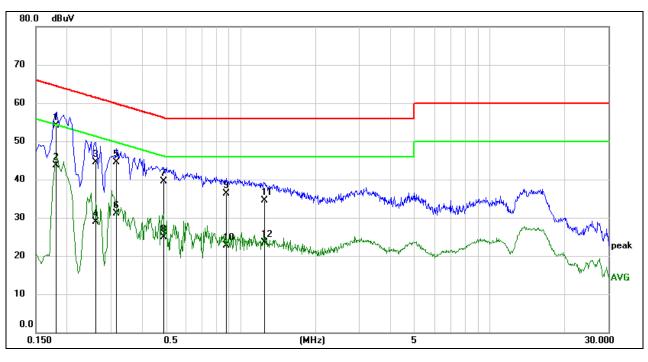
#### TEST ENVIRONMENT

Temperature	22 C	Relative Humidity	58 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V



## 9.1.1. 802. 11a 20 SISO MODE AT ANTENNA 1

#### LINE N RESULTS (UNII-1 BAND LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> )	(dBuV)	(dBuV)	( <b>dB</b> )	
1	0.1804	44.54	9.59	54.13	64.47	-10.34	QP
2	0.1804	34.09	9.59	43.68	54.47	-10.79	AVG
3	0.2611	34.82	9.59	44.41	61.40	-16.99	QP
4	0.2611	19.27	9.59	28.86	51.40	-22.54	AVG
5	0.3150	34.99	9.59	44.58	59.84	-15.26	QP
6	0.3150	21.54	9.59	31.13	49.84	-18.71	AVG
7	0.4930	29.87	9.60	39.47	56.12	-16.65	QP
8	0.4930	15.29	9.60	24.89	46.12	-21.23	AVG
9	0.8722	26.71	9.60	36.31	56.00	-19.69	QP
10	0.8722	13.13	9.60	22.73	46.00	-23.27	AVG
11	1.2465	24.94	9.61	34.55	56.00	-21.45	QP
12	1.2465	13.84	9.61	23.45	46.00	-22.55	AVG

Note: 1. Result = Reading + Correct Factor.

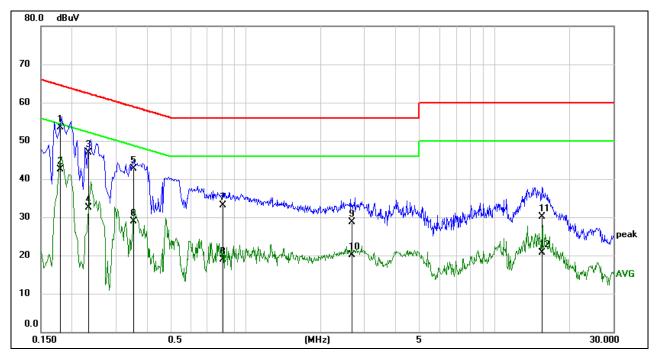
- 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.
- 3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).

4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

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#### LINE L RESULTS (UNII-1 BAND LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	( <b>dB</b> )	(dBuV)	(dBuV)	( <b>dB</b> )	
1	0.1788	43.85	9.59	53.44	64.54	-11.10	QP
2	0.1788	32.99	9.59	42.58	54.54	-11.96	AVG
3	0.2336	37.25	9.59	46.84	62.32	-15.48	QP
4	0.2336	22.82	9.59	32.41	52.32	-19.91	AVG
5	0.3530	33.18	9.59	42.77	58.89	-16.12	QP
6	0.3530	19.40	9.59	28.99	48.89	-19.90	AVG
7	0.8100	23.46	9.60	33.06	56.00	-22.94	QP
8	0.8100	9.32	9.60	18.92	46.00	-27.08	AVG
9	2.6694	18.99	9.62	28.61	56.00	-27.39	QP
10	2.6694	10.57	9.62	20.19	46.00	-25.81	AVG
11	15.4857	20.36	9.66	30.02	60.00	-29.98	QP
12	15.4857	11.05	9.66	20.71	50.00	-29.29	AVG

Note: 1. Result = Reading + Correct Factor.

2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Test setup: RBW: 200 Hz (9 kHz ~ 150 kHz), 9 kHz (150 kHz ~ 30 MHz).

4. Step size: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes, antennas and channels had been tested, but only the worst data was recorded in the report.



# **10. FREQUENCY STABILITY**

#### LIMITS

The frequency of the carrier signal shall be maintained within band of operation.

#### TEST PROCEDURE

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between 0  $\degree$  ~ 40  $\degree$ C (declared by customer).

2. The temperature was incremented by 10 °C intervals and the unit allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

3. The primary supply voltage is varied from 85 % to 115 % of the nominal value for non handcarried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

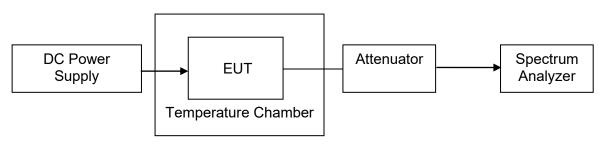
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	10 kHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Connect the EUT to the spectrum analyser and use the following settings:

4. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup, and at 2 minutes, 5minutes, and 10 minutes after the EUT is energized.

5. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

#### TEST SETUP





#### TEST ENVIRONMENT

	Normal Test Conditions	Extreme Test Conditions
Tomporatura	NT(Normal Temperature):	LT(Low Temperature): 0℃
Temperature	26.7°C	HT(High Temperature): 40℃
Supply Voltage	NV(Normal Voltage): DC 5V	LT(Low Voltage): DC 4.25V
Supply Voltage	NV(Normal Voltage). DC 5V	HT(High Voltage): DC 5.75V

Note: The value of the Supply Voltage was declared by customer.

#### **RESULTS**

Please refer to Appendix E.



# 11. DYNAMIC FREQUENCY SELECTION

#### APPLICABILITY OF DFS REQUIREMENTS

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.

Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

Table 1. Applicability of Di & Requirements i hor to ose of a Channel					
		Operational Mode			
Requirement		Client Without	Client With Radar		
	Master	Radar Detection	Detection		
Non-Occupancy Period	Yes	Not required	Yes		
DFS Detection Threshold	Yes	Not required	Yes		
Channel Availability Check Time	Yes	Not required	Not required		
U-NII Detection Bandwidth	Yes	Not required	Yes		

#### Table 1: Applicability of DFS Requirements Prior to Use of a Channel

#### Table 2: Applicability of DFS requirements during normal operation

	Operatior	nal Mode
Requirement	Master Device or Client with Radar Detection	Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	Master Device or Client with Radar Detection	Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statisti	cal performance check should	d include several frequencies

Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



#### <u>LIMITS</u>

#### (1) DFS Detection Thresholds

#### Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Betection						
Maximum Transmit Power	Value (See Notes 1, 2, and 3)					
EIRP ≥ 200 milliwatt	-64 dBm					
EIRP < 200 milliwatt and	-62 dBm					
power spectral density < 10 dBm/MHz	-02 dBill					
EIRP < 200 milliwatt that do not meet the						
power	-64 dBm					
spectral density requirement						
Note 1: This is the level at the input of the rece	iver assuming a 0 dBi receive antenna.					
Note 2: Throughout these test procedures an a						
amplitude of the test transmission waveforms t	o account for variations in measurement					
equipment. This will ensure that the test signal	is at or above the detection threshold level to					
trigger a DFS response.						
Note3: EIRP is based on the highest antenna	gain. For MIMO devices refer to KDB					
Publication 662911 D01.						

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value			
Non-occupancy period	Minimum 30 minutes			
Channel Availability Check Time	60 seconds			
Channel Move Time	10 seconds			
	See Note 1.			
	200 milliseconds + an aggregate of 60			
Channel Closing Transmission Time	milliseconds over			
	remaining 10 second period.			
	See Notes 1 and 2.			
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission			
	power bandwidth. See Note 3.			

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.



#### PARAMETERS OF RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

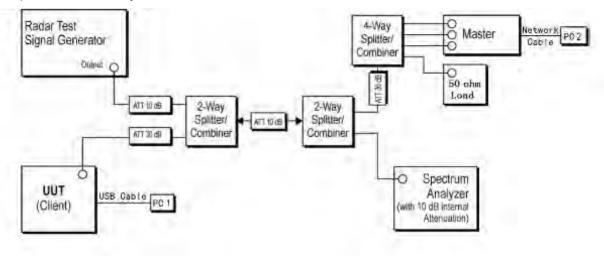
Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
Q	1	1428	18	See Note 1	See Note 1
		Test A	(1)		
1	1	Test B	$\begin{array}{c} \text{Roundup} \\ \left( \frac{19 \cdot 10^{\prime\prime}}{\text{PRI}_{\text{max}}} \right) \end{array}$	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (F	Radar Types 1-4	)		80%	120
and ch Test A: 15 ui Test B: 15 ui	nannel closing ti nique PRI values nique PRI values	me tests. s randomly se s randomly se	lected from the list of 23	n bandwidth test, channe PRI values in Table 5a of 518-3066 µsec, with a A	

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4.



#### TEST SETUP

Setup for Client with injection at the Master



#### **TEST ENVIRONMENT**

Temperature	26.7 C	Relative Humidity	60.2 %
Atmosphere Pressure	101 kPa	Test Voltage	DC 5 V

#### **RESULTS**

Please refer to Appendix F.



# 12. ANTENNA REQUIREMENTS

#### APPLICABLE REQUIREMENTS

## Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

## Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### **RESULTS**

Complies



# 13. Appendix

## 13.1. Appendix A1: Emission Bandwidth 13.1.1. Test Result

Test Mode	Antenna	Channel	26db EBW [MHz]	FL[MHz]	FH[MHz]	Verdict
	Ant1	5180	19.840	5170.080	5189.920	PASS
	Ant2	5180	19.400	5170.280	5189.680	PASS
	Ant1	5200	19.680	5190.280	5209.960	PASS
	Ant2	5200	19.720	5190.280	5210.000	PASS
	Ant1	5240	19.880	5230.120	5250.000	PASS
	Ant2	5240	19.720	5230.120	5249.840	PASS
	Ant1	5260	19.920	5249.920	5269.840	PASS
	Ant2	5260	19.720	5250.080	5269.800	PASS
	Ant1	5280	19.520	5270.120	5289.640	PASS
	Ant2	5280	19.560	5270.240	5289.800	PASS
	Ant1	5320	19.560	5310.240	5329.800	PASS
	Ant2	5320	19.680	5310.320	5330.000	PASS
	Ant1	5500	19.480	5490.320	5509.800	PASS
	Ant2	5500	19.800	5490.080	5509.880	PASS
	Ant1	5580	19.840	5570.160	5590.000	PASS
11A	Ant2	5580	20.040	5570.040	5590.080	PASS
	Ant1	5700	20.040	5690.080	5710.120	PASS
	Ant2	5700	19.800	5689.960	5709.760	PASS
	Ant1	5720	19.280	5710.440	5729.720	PASS
	Ant2	5720	19.720	5710.200	5729.920	PASS
	Ant1	5720 UNII-2C	14.56	5710.440	5725	PASS
	Ant2	5720 UNII-2C	14.8	5710.200	5725	PASS
	Ant1	5720 UNII-3	4.72	5725	5729.720	PASS
	Ant2	5720 UNII-3	4.92	5725	5729.920	PASS
	Ant1	5745	19.880	5735.080	5754.960	PASS
	Ant2	5745	20.320	5734.840	5755.160	PASS
	Ant1	5785	20.400	5774.800	5795.200	PASS
	Ant2	5785	19.520	5775.360	5794.880	PASS
	Ant2 Ant1	5825	19.960	5815.200	5835.160	PASS
	Ant2	5825	19.280	5815.240	5834.520	PASS
	Ant2 Ant1	5180	19.880			PASS
	Ant1 Ant2	5180	19.600	5170.200 5170.480	5190.080	PASS
		5200	20.160		5190.080 5210.280	PASS
	Ant1	5200		5190.120		PASS
	Ant2		19.920	5190.480	5210.400	
	Ant1	5240	19.960	5230.600	5250.560	PASS
	Ant2	5240	19.560	5230.520	5250.080	PASS
	Ant1	5260	19.840	5250.440	5270.280	PASS
	Ant2	5260	20.240	5250.480	5270.720	PASS
	Ant1	5280	19.840	5270.400	5290.240	PASS
	Ant2	5280	19.880	5270.480	5290.360	PASS
11N20MIMO	Ant1	5320	20.200	5310.360	5330.560	PASS
	Ant2	5320	19.680	5310.760	5330.440	PASS
	Ant1	5500	19.880	5490.160	5510.040	PASS
	Ant2	5500	20.160	5490.400	5510.560	PASS
	Ant1	5580	19.920	5570.520	5590.440	PASS
	Ant2	5580	20.200	5570.400	5590.600	PASS
	Ant1	5700	19.760	5690.640	5710.400	PASS
	Ant2	5700	20.120	5690.480	5710.600	PASS
	Ant1	5720	20.200	5710.200	5730.400	PASS
	Ant2	5720	20.200	5710.480	5730.680	PASS
	Ant1	5720_UNII-2C	14.8	5710.200	5725	PASS
	Ant2	5720_UNII-2C	14.52	5710.480	5725	PASS



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	Ant1	5720 UNII-3	5.4	5725	5730.400	PASS
	Ant1 Ant2	5720_0111-3	5.68	5725	5730.680	PASS
	Ant1	5745	20.360	5735.360	5755.720	PASS
	Ant2	5745	20.280	5735.480	5755.760	PASS
	Ant1	5785	22.240	5774.760	5797.000	PASS
	Ant2	5785	20.440	5775.440	5795.880	PASS
	Ant1	5825	19.880	5815.520	5835.400	PASS
	Ant2	5825	19.720	5815.720	5835.440	PASS
	Ant1	5190	40.800	5169.280	5210.080	PASS
	Ant2	5190	39.760	5170.320	5210.080	PASS
	Ant1	5230	39.920	5210.000	5249.920	PASS
	Ant2	5230	39.680	5210.000	5249.680	PASS
	Ant1	5270	39.600	5250.400	5290.000	PASS
	Ant2	5270	40.480	5249.760	5290.240	PASS
	Ant1	5310	40.240	5289.920	5330.160	PASS
	Ant2	5310	39.200	5290.800	5330.000	PASS
	Ant1	5510	40.320	5490.160	5530.480	PASS
	Ant2	5510	38.800	5490.800	5529.600	PASS
	Ant1	5550	40.160	5529.920	5570.080	PASS
	Ant2	5550	39.920	5530.240	5570.160	PASS
11N40MIMO	Ant1	5670	40.560	5650.000	5690.560	PASS
	Ant2	5670	40.160	5649.920	5690.080	PASS
	Ant1	5710	40.640	5689.920	5730.560	PASS
	Ant2	5710	39.840	5690.640	5730.480	PASS
	Ant1	5710 UNII-2C	35.08	5689.920	5725	PASS
	Ant2	5710 UNII-2C	34.36	5690.640	5725	PASS
	Ant1	5710 UNII-3	5.56	5725	5730.560	PASS
	Ant2	5710 UNII-3	5.48	5725	5730.480	PASS
	Ant1	5755	40.560	5735.320	5775.880	PASS
	Ant2	5755	40.160	5734.760	5774.920	PASS
	Ant1	5795	39.840	5775.320	5815.160	PASS
	Ant2	5795	39.600	5775.560	5815.160	PASS
	Ant1	5180	20.200	5170.040	5190.240	PASS
	Ant2	5180	19.680	5170.360	5190.040	PASS
	Ant1	5200	20.040	5190.200	5210.240	PASS
	Ant2	5200	20.160	5190.320	5210.480	PASS
	Ant1	5240	20.120	5230.200	5250.320	PASS
	Ant2	5240	19.800	5230.320	5250.120	PASS
	Ant1	5260	20.120	5250.320	5270.440	PASS
	Ant2	5260	20.040	5250.240	5270.280	PASS
	Ant1	5280	19.560	5270.360	5289.920	PASS
	Ant2	5280	19.920	5270.320	5290.240	PASS
	Ant1	5320	19.800	5310.400	5330.200	PASS
	Ant2	5320	19.760	5310.240	5330.000	PASS
	Ant1	5500	20.200	5490.000	5510.200	PASS
11AC20MIMO	Ant2	5500	19.400	5490.560	5509.960	PASS
TACZUNINIO	Ant1	5580	20.120	5570.200	5590.320	PASS
	Ant2	5580	19.720	5570.320	5590.040	PASS
	Ant1	5700	19.920	5690.240	5710.160	PASS
	Ant2	5700	19.880	5690.400	5710.280	PASS
	Ant1	5720	20.080	5710.400	5730.480	PASS
	Ant2	5720	19.520	5710.520	5730.040	PASS
	Ant1	5720_UNII-2C	14.6	5710.400	5725	PASS
	Ant2	5720_UNII-2C	14.48	5710.520	5725	PASS
	Ant1	5720_UNII-3	5.48	5725	5730.480	PASS
	Ant2	5720_UNII-3	5.04	5725	5730.040	PASS
	Ant1	5745	19.920	5735.360	5755.280	PASS
	Ant2	5745	20.520	5734.960	5755.480	PASS
	Ant1	5785	20.040	5775.040	5795.080	PASS
	Ant2	5785	19.720	5775.440	5795.160	PASS



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	Ant1	5825	20.120	5815.200	5835.320	PASS
	Ant2	5825	20.240	5815.080	5835.320	PASS
	Ant1	5190	39.440	5170.400	5209.840	PASS
	Ant2	5190	39.360	5170.480	5209.840	PASS
	Ant1	5230	40.160	5210.000	5250.160	PASS
	Ant2	5230	39.200	5210.720	5249.920	PASS
	Ant1	5270	39.680	5250.320	5290.000	PASS
	Ant2	5270	39.360	5250.400	5289.760	PASS
	Ant1	5310	39.920	5290.480	5330.400	PASS
	Ant2	5310	40.240	5290.240	5330.480	PASS
	Ant1	5510	40.400	5490.320	5530.720	PASS
	Ant2	5510	38.720	5490.960	5529.680	PASS
	Ant1	5550	39.840	5530.320	5570.160	PASS
	Ant2	5550	40.320	5530.000	5570.320	PASS
11AC40MIMO	Ant1	5670	39.840	5650.480	5690.320	PASS
	Ant2	5670	40.080	5650.240	5690.320	PASS
	Ant1	5710	40.000	5690.320	5730.320	PASS
	Ant2	5710	39.760	5690.320	5730.080	PASS
	Ant1	5710 UNII-2C	34.68	5690.320	5725	PASS
	Ant2	5710 UNII-2C	34.68	5690.320	5725	PASS
	Ant1	5710 UNII-3	5.32	5725	5730.320	PASS
	Ant2	5710 UNII-3	5.08	5725	5730.080	PASS
	Ant1	5755	39.920	5735.560	5775.480	PASS
	Ant2	5755	40.400	5735.080	5775.480	PASS
	Ant1	5795	39.680	5775.400	5815.080	PASS
	Ant2	5795	40.480	5774.840	5815.320	PASS
	Ant1	5210	80.160	5169.520	5249.680	PASS
	Ant2	5210	80.480	5170.160	5250.640	PASS
	Ant1	5290	80.320	5250.000	5330.320	PASS
	Ant2	5290	79.680	5250.320	5330.000	PASS
	Ant1	5530	79.680	5490.160	5569.840	PASS
	Ant2	5530	78.880	5490.640	5569.520	PASS
	Ant1	5610	81.120	5569.360	5650.480	PASS
	Ant2	5610	79.520	5570.160	5649.680	PASS
11AC80MIMO	Ant1	5690	79.840	5650.000	5729.840	PASS
	Ant2	5690	79.200	5650.480	5729.680	PASS
	Ant1	5690 UNII-2C	75	5650.000	5725	PASS
	Ant2	5690 UNII-2C	74.52	5650.480	5725	PASS
	Ant1	5690 UNII-3	4.84	5725	5729.840	PASS
	Ant2	5690 UNII-3	4.68	5725	5729.680	PASS
	Ant1	5775	80.000	5734.840	5814.840	PASS
	Ant2	5775	79.360	5735.320	5814.680	PASS

# 13.1.2. Test Graphs





















































