



## Appendix A. Radiated Spurious Emission

|                 |                                    |                     |         |
|-----------------|------------------------------------|---------------------|---------|
| Test Engineer : | Ken Wu, Jesse Wang, and James Chiu | Temperature :       | 21~24°C |
|                 |                                    | Relative Humidity : | 50~54%  |

Band 1 - 5150~5250MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

| WIFI                                | Note                                                                                        | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|-------------------------------------|---------------------------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| Ant.                                |                                                                                             |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
| 1                                   |                                                                                             | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| 802.11n<br>HT40<br>CH 38<br>5190MHz |                                                                                             | 5149.5    | 57.45      | -16.55 | 74         | 47.63    | 33.69    | 11.21  | 35.08  | 217    | 48      | P       | H       |
|                                     |                                                                                             | 5147.68   | 50.13      | -3.87  | 54         | 40.31    | 33.69    | 11.21  | 35.08  | 217    | 48      | A       | H       |
|                                     | *                                                                                           | 5190      | 101.96     | -      | -          | 92.01    | 33.78    | 11.25  | 35.08  | 217    | 48      | P       | H       |
|                                     | *                                                                                           | 5190      | 93.55      | -      | -          | 83.6     | 33.78    | 11.25  | 35.08  | 217    | 48      | A       | H       |
|                                     |                                                                                             | 5441.52   | 49.59      | -24.41 | 74         | 38.36    | 34.43    | 11.89  | 35.09  | 217    | 48      | P       | H       |
|                                     |                                                                                             | 5358      | 41.8       | -12.2  | 54         | 30.91    | 34.21    | 11.76  | 35.08  | 217    | 48      | A       | H       |
|                                     |                                                                                             | 5149.24   | 54.93      | -19.07 | 74         | 45.11    | 33.69    | 11.21  | 35.08  | 200    | 73      | P       | V       |
|                                     |                                                                                             | 5149.76   | 49.28      | -4.72  | 54         | 39.46    | 33.69    | 11.21  | 35.08  | 200    | 73      | A       | V       |
|                                     | *                                                                                           | 5190      | 100.5      | -      | -          | 90.55    | 33.78    | 11.25  | 35.08  | 200    | 73      | P       | V       |
|                                     | *                                                                                           | 5190      | 92.17      | -      | -          | 82.22    | 33.78    | 11.25  | 35.08  | 200    | 73      | A       | V       |
|                                     |                                                                                             | 5352.24   | 49.44      | -24.56 | 74         | 38.55    | 34.21    | 11.76  | 35.08  | 200    | 73      | P       | V       |
|                                     |                                                                                             | 5456.64   | 41.22      | -12.78 | 54         | 29.95    | 34.47    | 11.89  | 35.09  | 200    | 73      | A       | V       |
| Remark                              | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |         |         |

**Band 1 5150~5250MHz****WIFI 802.11n HT40 (Harmonic @ 3m)**

| WIFI<br>Ant.<br>1                   | Note                                                                                        | Frequency<br>( MHz ) | Level<br>( dBμV/m ) | Over<br>Limit<br>( dB ) | Limit<br>Line<br>( dBμV/m ) | Read<br>Level<br>(dBμV) | Antenna<br>Factor<br>( dB/m ) | Cable<br>Loss<br>( dB ) | Preamp<br>Factor<br>( dB ) | Ant<br>Pos<br>( cm ) | Table<br>Pos<br>( deg ) | Peak<br>Avg.<br>(P/A) | Pol.<br>(H/V) |
|-------------------------------------|---------------------------------------------------------------------------------------------|----------------------|---------------------|-------------------------|-----------------------------|-------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-----------------------|---------------|
| 802.11n<br>HT40<br>CH 38<br>5190MHz |                                                                                             | 10380                | 45.36               | -28.64                  | 74                          | 48.27                   | 39.11                         | 17.17                   | 59.19                      | 100                  | 0                       | P                     | H             |
|                                     |                                                                                             | 15570                | 46.7                | -27.3                   | 74                          | 43.09                   | 41.14                         | 19.63                   | 57.16                      | 100                  | 0                       | P                     | H             |
|                                     |                                                                                             |                      |                     |                         |                             |                         |                               |                         |                            |                      |                         |                       | H             |
|                                     |                                                                                             |                      |                     |                         |                             |                         |                               |                         |                            |                      |                         |                       | H             |
|                                     |                                                                                             | 10380                | 45.02               | -28.98                  | 74                          | 47.93                   | 39.11                         | 17.17                   | 59.19                      | 100                  | 0                       | P                     | V             |
|                                     |                                                                                             | 15570                | 46.25               | -27.75                  | 74                          | 42.64                   | 41.14                         | 19.63                   | 57.16                      | 100                  | 0                       | P                     | V             |
|                                     |                                                                                             |                      |                     |                         |                             |                         |                               |                         |                            |                      |                         |                       | V             |
|                                     |                                                                                             |                      |                     |                         |                             |                         |                               |                         |                            |                      |                         |                       | V             |
| Remark                              | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |                      |                     |                         |                             |                         |                               |                         |                            |                      |                         |                       |               |

### Band 1 5150~5250MHz

## Emission below 1GHz

**WIFI 802.11n HT40 (LF @ 3m)**

| WIFI<br>Ant.                  | Note                                                                       | Frequency | Level      | Over<br>Limit | Limit<br>Line | Read<br>Level | Antenna<br>Factor | Cable<br>Loss | Preamp<br>Factor | Ant<br>Pos | Table<br>Pos | Peak<br>Avg. | Pol.  |
|-------------------------------|----------------------------------------------------------------------------|-----------|------------|---------------|---------------|---------------|-------------------|---------------|------------------|------------|--------------|--------------|-------|
| 1                             |                                                                            | ( MHz )   | ( dBμV/m ) | ( dB )        | ( dBμV/m )    | (dBμV)        | ( dB/m )          | ( dB )        | ( dB )           | ( cm )     | ( deg )      | (P/A)        | (H/V) |
| 802.11n<br><br>HT40<br><br>LF |                                                                            | 30        | 28.15      | -11.85        | 40            | 32.43         | 26                | 1.07          | 31.35            | 100        | 0            | P            | H     |
|                               |                                                                            | 48.36     | 24.04      | -15.96        | 40            | 38.63         | 15.93             | 1.07          | 31.59            | -          | -            | P            | H     |
|                               |                                                                            | 209.28    | 26.79      | -16.71        | 43.5          | 40.11         | 16.27             | 1.87          | 31.46            | -          | -            | P            | H     |
|                               |                                                                            | 454.7     | 26         | -20           | 46            | 30.99         | 23.21             | 2.89          | 31.09            | -          | -            | P            | H     |
|                               |                                                                            | 668.9     | 29.1       | -16.9         | 46            | 30.11         | 26.09             | 3.65          | 30.75            | -          | -            | P            | H     |
|                               |                                                                            | 952.4     | 33.35      | -12.65        | 46            | 29.6          | 30.21             | 4.07          | 30.53            | -          | -            | P            | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | H     |
|                               |                                                                            | 35.94     | 33.61      | -6.39         | 40            | 41.25         | 22.72             | 1.07          | 31.43            | -          | -            | P            | V     |
|                               |                                                                            | 38.91     | 34.45      | -5.55         | 40            | 43.86         | 20.98             | 1.07          | 31.46            | 100        | 116          | P            | V     |
|                               |                                                                            | 62.13     | 26.2       | -13.8         | 40            | 44.36         | 12.14             | 1.28          | 31.58            | -          | -            | P            | V     |
|                               |                                                                            | 475       | 26.36      | -19.64        | 46            | 30.73         | 23.65             | 3.04          | 31.06            | -          | -            | P            | V     |
|                               |                                                                            | 808.9     | 30.99      | -15.01        | 46            | 29.8          | 27.88             | 3.9           | 30.59            | -          | -            | P            | V     |
|                               |                                                                            | 918.8     | 33.13      | -12.87        | 46            | 30.1          | 29.45             | 4.12          | 30.54            | -          | -            | P            | V     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | V     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              |              | V     |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              | V            |       |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              | V            |       |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              | V            |       |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              | V            |       |
|                               |                                                                            |           |            |               |               |               |                   |               |                  |            |              | V            |       |
| Remark                        | 1. No other spurious found.<br>2. All results are PASS against limit line. |           |            |               |               |               |                   |               |                  |            |              |              |       |

**Note symbol**

|     |                                                                                                                                                          |
|-----|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| *   | <b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| !   | Test result is <b>over limit</b> line.                                                                                                                   |
| P/A | <b>P</b> eak or <b>A</b> verage                                                                                                                          |
| H/V | <b>H</b> orizontal or <b>V</b> ertical                                                                                                                   |

A calculation example for radiated spurious emission is shown as below:

| WIFI    | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|---------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
| Ant.    |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
| 1       |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| 802.11b |      | 2390      | 55.45      | -18.55 | 74         | 54.51    | 32.22    | 4.58   | 35.86  | 103    | 308     | P       | H       |
| CH 01   |      |           |            |        |            |          |          |        |        |        |         |         |         |
| 2412MHz |      | 2390      | 43.54      | -10.46 | 54         | 42.6     | 32.22    | 4.58   | 35.86  | 103    | 308     | A       | H       |

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is “PASS”.**