



## Appendix A. Radiated Spurious Emission

|                 |                                 |                     |         |
|-----------------|---------------------------------|---------------------|---------|
| Test Engineer : | Stan Hsieh, Nick Tu, and Ken Wu | Temperature :       | 21~23°C |
|                 |                                 | Relative Humidity : | 47~49%  |

15C 2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

| BT                     | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|------------------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
|                        |      |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
|                        |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| BT<br>CH00<br>2402MHz  |      | 2336.91   | 56.85      | -17.15 | 74         | 51.36    | 32.11    | 7.6    | 34.22  | 100    | 316     | P       | H       |
|                        |      | 2336.91   | 32.09      | -21.91 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        | *    | 2402.17   | 105.7      | -      | -          | 100.07   | 32.18    | 7.75   | 34.3   | 100    | 316     | P       | H       |
|                        | *    | 2402.17   | 80.94      | -      | -          | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |      |           |            |        |            |          |          |        |        |        |         |         | H       |
|                        |      |           |            |        |            |          |          |        |        |        |         |         | H       |
|                        |      | 2382.67   | 58.89      | -15.11 | 74         | 53.25    | 32.16    | 7.75   | 34.27  | 300    | 245     | P       | V       |
|                        |      | 2382.67   | 34.13      | -19.87 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
|                        | *    | 2402.17   | 106.68     | -      | -          | 101.05   | 32.18    | 7.75   | 34.3   | 300    | 245     | P       | V       |
|                        | *    | 2402.17   | 81.92      | -      | -          | -        | -        | -      | -      | -      | -       | A       | V       |
|                        |      |           |            |        |            |          |          |        |        |        |         |         | V       |
|                        |      |           |            |        |            |          |          |        |        |        |         |         | V       |
| BT<br>CH 39<br>2441MHz |      | 2386.57   | 56.03      | -17.97 | 74         | 50.37    | 32.18    | 7.75   | 34.27  | 100    | 20      | P       | H       |
|                        |      | 2386.57   | 31.27      | -22.73 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        | *    | 2441.1    | 103.87     | -      | -          | 98.19    | 32.24    | 7.83   | 34.39  | 100    | 20      | P       | H       |
|                        | *    | 2441.1    | 79.11      | -      | -          | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |      | 2486.7    | 46.78      | -27.22 | 74         | 41.02    | 32.28    | 7.91   | 34.43  | 100    | 20      | P       | H       |
|                        |      | 2486.7    | 22.02      | -31.98 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |      | 2386      | 52.53      | -21.47 | 74         | 46.87    | 32.18    | 7.75   | 34.27  | 125    | 335     | P       | V       |
|                        |      | 2386      | 27.77      | -26.23 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
|                        | *    | 2441.1    | 106.17     | -      | -          | 100.49   | 32.24    | 7.83   | 34.39  | 125    | 335     | P       | V       |
|                        | *    | 2441.1    | 81.41      | -      | -          | -        | -        | -      | -      | -      | -       | A       | V       |
|                        |      | 2492.21   | 49.37      | -24.63 | 74         | 43.64    | 32.3     | 7.91   | 34.48  | 125    | 335     | P       | V       |
|                        |      | 2492.21   | 24.61      | -29.39 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |



|                                 |                                                                                             |         |        |        |    |        |       |      |       |     |     |   |   |
|---------------------------------|---------------------------------------------------------------------------------------------|---------|--------|--------|----|--------|-------|------|-------|-----|-----|---|---|
| <b>BT<br/>CH 78<br/>2480MHz</b> | *                                                                                           | 2480.05 | 104.26 | -      | -  | 98.5   | 32.28 | 7.91 | 34.43 | 105 | 304 | P | H |
|                                 | *                                                                                           | 2480.05 | 79.5   | -      | -  | -      | -     | -    | -     | -   | -   | A | H |
|                                 |                                                                                             | 2483.5  | 59.27  | -14.73 | 74 | 53.51  | 32.28 | 7.91 | 34.43 | 105 | 304 | P | H |
|                                 |                                                                                             | 2483.5  | 34.51  | -19.49 | 54 | -      | -     | -    | -     | -   | -   | A | H |
|                                 |                                                                                             |         |        |        |    |        |       |      |       |     |     |   | H |
|                                 |                                                                                             |         |        |        |    |        |       |      |       |     |     |   | H |
|                                 | *                                                                                           | 2480.05 | 108.58 | -      | -  | 102.82 | 32.28 | 7.91 | 34.43 | 293 | 282 | P | V |
|                                 | *                                                                                           | 2480.05 | 83.82  | -      | -  | -      | -     | -    | -     | -   | -   | A | V |
|                                 |                                                                                             | 2483.5  | 64.16  | -9.84  | 74 | 58.4   | 32.28 | 7.91 | 34.43 | 293 | 282 | P | V |
|                                 |                                                                                             | 2483.5  | 39.4   | -14.6  | 54 | -      | -     | -    | -     | -   | -   | A | V |
|                                 |                                                                                             |         |        |        |    |        |       |      |       |     |     |   | V |
|                                 |                                                                                             |         |        |        |    |        |       |      |       |     |     |   | V |
| <b>Remark</b>                   | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |         |        |        |    |        |       |      |       |     |     |   |   |



## 15C 2.4GHz 2400~2483.5MHz

## BT (Harmonic @ 3m)

| BT                     | Note                                                                                        | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|------------------------|---------------------------------------------------------------------------------------------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
|                        |                                                                                             |           |            | Limit  | Line       | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
|                        |                                                                                             | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| BT<br>CH 00<br>2402MHz |                                                                                             | 4806      | 55.67      | -18.33 | 74         | 69.27    | 34.25    | 11.11  | 58.96  | 100    | 0       | P       | H       |
|                        |                                                                                             | 4806      | 30.91      | -23.09 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |                                                                                             |           |            |        |            |          |          |        |        |        |         |         | H       |
|                        |                                                                                             |           |            |        |            |          |          |        |        |        |         |         | H       |
|                        |                                                                                             | 4806      | 57.71      | -16.29 | 74         | 71.31    | 34.25    | 11.11  | 58.96  | 100    | 0       | P       | V       |
|                        |                                                                                             | 4806      | 32.95      | -21.05 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
|                        |                                                                                             |           |            |        |            |          |          |        |        |        |         |         | V       |
|                        |                                                                                             |           |            |        |            |          |          |        |        |        |         |         | V       |
| BT<br>CH 39<br>2441MHz |                                                                                             | 4884      | 55.25      | -18.75 | 74         | 68.57    | 34.3     | 11.21  | 58.83  | 100    | 0       | P       | H       |
|                        |                                                                                             | 4884      | 30.49      | -23.51 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |                                                                                             | 7320      | 57.78      | -16.22 | 74         | 64.84    | 35.6     | 15.08  | 57.74  | 100    | 0       | P       | H       |
|                        |                                                                                             | 7320      | 33.02      | -20.98 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |                                                                                             | 4884      | 57.28      | -16.72 | 74         | 70.6     | 34.3     | 11.21  | 58.83  | 100    | 0       | P       | V       |
|                        |                                                                                             | 4884      | 32.52      | -21.48 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
|                        |                                                                                             | 7320      | 58.31      | -15.69 | 74         | 65.37    | 35.6     | 15.08  | 57.74  | 100    | 0       | P       | V       |
|                        |                                                                                             | 7320      | 33.55      | -20.45 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
| BT<br>CH 78<br>2480MHz |                                                                                             | 4962      | 60.88      | -13.12 | 74         | 73.85    | 34.37    | 11.32  | 58.66  | 100    | 0       | P       | H       |
|                        |                                                                                             | 4962      | 36.12      | -17.88 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |                                                                                             | 7440      | 60.73      | -13.27 | 74         | 67.85    | 35.6     | 15.13  | 57.85  | 100    | 0       | P       | H       |
|                        |                                                                                             | 7440      | 35.97      | -18.03 | 54         | -        | -        | -      | -      | -      | -       | A       | H       |
|                        |                                                                                             | 4962      | 60.29      | -13.71 | 74         | 73.26    | 34.37    | 11.32  | 58.66  | 100    | 0       | P       | V       |
|                        |                                                                                             | 4962      | 35.53      | -18.47 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
|                        |                                                                                             | 7440      | 60.4       | -13.6  | 74         | 67.52    | 35.6     | 15.13  | 57.85  | 100    | 0       | P       | V       |
|                        |                                                                                             | 7440      | 35.64      | -18.36 | 54         | -        | -        | -      | -      | -      | -       | A       | V       |
| Remark                 | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |         |         |

### 15C Emission below 1GHz

## 2.4GHz BT (LF)

[illegible]



**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 per 15.209(c). |
| !   | 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+2     |      | ( 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”.**