



## Appendix B. Radiated Spurious Emission

|                 |                                     |                     |         |
|-----------------|-------------------------------------|---------------------|---------|
| Test Engineer : | Bill Chang, Jesse Wang, and Nick Yu | Temperature :       | 22~23°C |
|                 |                                     | Relative Humidity : | 51~55%  |

<For Sample 1>

### 2.4GHz 2400~2483.5MHz

#### BLE (Band Edge @ 3m)

| BLE                     | Note | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |   |
|-------------------------|------|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|---|
|                         |      | ( MHz )   | ( dBμV/m ) | ( dB ) | Limit      | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |   |
|                         |      | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |   |
| BLE<br>CH 00<br>2402MHz |      | 2375.16   | 50.96      | -23.04 | 74         | 51.8     | 27.19    | 6.01   | 34.04  | 111    | 116     | P       | H       |   |
|                         |      | 2389.11   | 39.77      | -14.23 | 54         | 40.57    | 27.23    | 6.01   | 34.04  | 111    | 116     | A       | H       |   |
|                         | *    | 2402      | 83.84      | -      | -          | 84.64    | 27.23    | 6.01   | 34.04  | 111    | 116     | P       | H       |   |
|                         | *    | 2402      | 83.01      | -      | -          | 83.81    | 27.23    | 6.01   | 34.04  | 111    | 116     | A       | H       |   |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                         |      |           | 2357.79    | 50.76  | -23.24     | 74       | 51.72    | 27.14  | 5.95   | 34.05  | 103     | 225     | P       | V |
|                         |      |           | 2385.33    | 39.78  | -14.22     | 54       | 40.62    | 27.19  | 6.01   | 34.04  | 103     | 225     | A       | V |
|                         | *    |           | 2402       | 84.72  | -          | -        | 85.52    | 27.23  | 6.01   | 34.04  | 103     | 225     | P       | V |
|                         | *    |           | 2402       | 83.92  | -          | -        | 84.72    | 27.23  | 6.01   | 34.04  | 103     | 225     | A       | V |
|                         |      |           |            |        |            |          |          |        |        |        |         |         | V       |   |
| BLE<br>CH 19<br>2440MHz |      | 2333.22   | 50.94      | -23.06 | 74         | 52       | 27.05    | 5.95   | 34.06  | 105    | 100     | P       | H       |   |
|                         |      | 2383.1    | 39.76      | -14.24 | 54         | 40.6     | 27.19    | 6.01   | 34.04  | 105    | 100     | A       | H       |   |
|                         | *    | 2440      | 83.91      | -      | -          | 84.53    | 27.37    | 6.04   | 34.03  | 105    | 100     | P       | H       |   |
|                         | *    | 2440      | 83.06      | -      | -          | 83.68    | 27.37    | 6.04   | 34.03  | 105    | 100     | A       | H       |   |
|                         |      |           | 2484.12    | 50.76  | -23.24     | 74       | 51.22    | 27.46  | 6.09   | 34.01  | 105     | 100     | P       | H |
|                         |      |           | 2491.72    | 40.15  | -13.85     | 54       | 40.57    | 27.5   | 6.09   | 34.01  | 105     | 100     | A       | H |
|                         |      |           | 2328.63    | 50.54  | -23.46     | 74       | 51.6     | 27.05  | 5.95   | 34.06  | 149     | 223     | P       | V |
|                         |      |           | 2385.42    | 39.76  | -14.24     | 54       | 40.6     | 27.19  | 6.01   | 34.04  | 149     | 223     | A       | V |
|                         | *    |           | 2440       | 84.07  | -          | -        | 84.69    | 27.37  | 6.04   | 34.03  | 149     | 223     | P       | V |
|                         | *    |           | 2440       | 83.2   | -          | -        | 83.82    | 27.37  | 6.04   | 34.03  | 149     | 223     | A       | V |
|                         |      |           | 2491.8     | 51.63  | -22.37     | 74       | 52.04    | 27.5   | 6.09   | 34     | 149     | 223     | P       | V |
|                         |      |           | 2490.56    | 40.14  | -13.86     | 54       | 40.56    | 27.5   | 6.09   | 34.01  | 149     | 223     | A       | V |



|                                  |   |          |       |        |    |       |       |      |       |     |     |   |   |
|----------------------------------|---|----------|-------|--------|----|-------|-------|------|-------|-----|-----|---|---|
| <b>BLE<br/>CH 39<br/>2480MHz</b> | *   | 2480.327 | 81.53 | -      | -  | 82.01 | 27.46 | 6.07 | 34.01 | 100 | 97  | P | H |
|                                  | *   | 2480.076 | 80.57 | -      | -  | 81.05 | 27.46 | 6.07 | 34.01 | 100 | 97  | A | H |
|                                  |   | 2495.44  | 50.95 | -23.05 | 74 | 51.36 | 27.5  | 6.09 | 34    | 100 | 97  | P | H |
|                                  |   | 2484.92  | 40.17 | -13.83 | 54 | 40.63 | 27.46 | 6.09 | 34.01 | 100 | 97  | A | H |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | H |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | H |
|                                  | *   | 2479.742 | 83.52 | -      | -  | 84    | 27.46 | 6.07 | 34.01 | 375 | 223 | P | V |
|                                  | *   | 2480.076 | 82.57 | -      | -  | 83.05 | 27.46 | 6.07 | 34.01 | 375 | 223 | A | V |
|                                  |   | 2492.4   | 50.98 | -23.02 | 74 | 51.39 | 27.5  | 6.09 | 34    | 375 | 223 | P | V |
|                                  |   | 2483.6   | 40.2  | -13.8  | 54 | 40.66 | 27.46 | 6.09 | 34.01 | 375 | 223 | A | V |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | V |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | V |
| Remark                           | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |          |       |        |    |       |       |      |       |     |     |   |   |



2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

| BLE                     | 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 ) |
| BLE<br>CH 00<br>2402MHz |   | 4804      | 44.94      | -29.06 | 74         | 70.08    | 31.3     | 8.65   | 65.09  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4804      | 50.1       | -23.9  | 74         | 75.24    | 31.3     | 8.65   | 65.09  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| BLE<br>CH 19<br>2440MHz |   | 4880      | 44.94      | -29.06 | 74         | 69.86    | 31.41    | 8.69   | 65.02  | 100    | 0       | P       | H       |
|                         |   | 7320      | 40.66      | -33.34 | 74         | 59.02    | 36.32    | 10.39  | 65.07  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4880      | 46.48      | -27.52 | 74         | 71.4     | 31.41    | 8.69   | 65.02  | 100    | 0       | P       | V       |
|                         |   | 7320      | 41.14      | -32.86 | 74         | 59.5     | 36.32    | 10.39  | 65.07  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| BLE<br>CH 39<br>2480MHz |   | 4960      | 43.07      | -30.93 | 74         | 67.67    | 31.54    | 8.79   | 64.93  | 100    | 0       | P       | H       |
|                         |   | 7440      | 40.73      | -33.27 | 74         | 58.71    | 36.59    | 10.52  | 65.09  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4960      | 46.09      | -27.91 | 74         | 70.69    | 31.54    | 8.79   | 64.93  | 100    | 0       | P       | V       |
|                         |   | 7440      | 41.35      | -32.65 | 74         | 59.33    | 36.59    | 10.52  | 65.09  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| Remark                  | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |         |         |



Emission below 1GHz

2.4GHz BLE (LF)

| BLE                 | Note   | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |   |
|---------------------|--|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|---|
|                     |  | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |   |
| 2.4GHz<br>BLE<br>LF |  | 31.62     | 16.09      | -23.91 | 40         | 28.33    | 18.92    | 0.67   | 31.83  |        |         | P       | H       |   |
|                     |  | 56.73     | 16.29      | -23.71 | 40         | 40.02    | 7.03     | 1.04   | 31.8   |        |         | P       | H       |   |
|                     |  | 112.08    | 13.83      | -29.67 | 43.5       | 32.79    | 11.54    | 1.28   | 31.78  |        |         | P       | H       |   |
|                     |  | 750.8     | 21.58      | -24.42 | 46         | 28.7     | 21.61    | 3.25   | 31.98  |        |         | P       | H       |   |
|                     |  | 839       | 22.98      | -23.02 | 46         | 28.9     | 22.41    | 3.4    | 31.73  |        |         | P       | H       |   |
|                     |  | 945.4     | 23.48      | -22.52 | 46         | 26.66    | 24.21    | 3.68   | 31.07  | 121    | 25      | P       | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |         | H       |   |
|                     |  |           | 30.27      | 25.72  | -14.28     | 40       | 36.88    | 20     | 0.67   | 31.83  | 101     | 152     | P       | V |
|                     |  |           | 56.46      | 25.14  | -14.86     | 40       | 48.56    | 7.34   | 1.04   | 31.8   |         |         | P       | V |
|                     |  |           | 79.95      | 15.85  | -24.15     | 40       | 38.72    | 7.88   | 1.04   | 31.79  |         |         | P       | V |
|                     |  |           | 638.1      | 20.42  | -25.58     | 46       | 29.44    | 20.06  | 2.96   | 32.04  |         |         | P       | V |
|                     |  |           | 809.6      | 22.26  | -23.74     | 46       | 28.55    | 22.18  | 3.4    | 31.87  |         |         | P       | 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 per 15.209(c). |
| !   | Test result is <b>over limit</b> line.   |
| P/A | <b>Peak</b> or <b>Average</b>  |
| H/V | <b>Horizontal</b> or <b>Vertical</b>   |



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     |

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

**For Peak Limit @ 2390MHz:**

- 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)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

- 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)
- 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”.**



<For Sample 2>

2.4GHz 2400~2483.5MHz

BLE (Band Edge @ 3m)

| BLE                     | Note | Frequency | Level      | Over   | Limit  | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |   |
|-------------------------|------|-----------|------------|--------|--------|----------|----------|--------|--------|--------|---------|-------|-------|---|
|                         |      | ( MHz )   | ( dBμV/m ) | ( dB ) | Limit  | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.  |       |   |
|                         |      |           |            |        | Line   | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |   |
| BLE<br>CH 00<br>2402MHz |      | 2386.59   | 50.74      | -23.26 | 74     | 51.54    | 27.23    | 6.01   | 34.04  | 166    | 150     | P     | H     |   |
|                         |      | 2388.21   | 39.85      | -14.15 | 54     | 40.65    | 27.23    | 6.01   | 34.04  | 166    | 150     | A     | H     |   |
|                         | *    | 2401.837  | 85.08      | -      | -      | 85.88    | 27.23    | 6.01   | 34.04  | 166    | 150     | P     | H     |   |
|                         | *    | 2402.087  | 84.25      | -      | -      | 85.05    | 27.23    | 6.01   | 34.04  | 166    | 150     | A     | H     |   |
|                         |      |           |            |        |        |          |          |        |        |        |         |       | H     |   |
|                         |      |           |            |        |        |          |          |        |        |        |         |       |       | H |
|                         |      |           | 2339.97    | 50.7   | -23.3  | 74       | 51.7     | 27.1   | 5.95   | 34.05  | 100     | 122   | P     | V |
|                         |      |           | 2389.02    | 39.89  | -14.11 | 54       | 40.69    | 27.23  | 6.01   | 34.04  | 100     | 122   | A     | V |
|                         | *    |           | 2402.338   | 87.9   | -      | -        | 88.7     | 27.23  | 6.01   | 34.04  | 100     | 122   | P     | V |
|                         | *    |           | 2402.087   | 87.12  | -      | -        | 87.92    | 27.23  | 6.01   | 34.04  | 100     | 122   | A     | V |
|                         |      |           |            |        |        |          |          |        |        |        |         |       |       | V |
|                         |      |           |            |        |        |          |          |        |        |        |         |       | V     |   |
| BLE<br>CH 19<br>2440MHz |      | 2385.69   | 50.65      | -23.35 | 74     | 51.45    | 27.23    | 6.01   | 34.04  | 131    | 149     | P     | H     |   |
|                         |      | 2389.74   | 39.8       | -14.2  | 54     | 40.6     | 27.23    | 6.01   | 34.04  | 131    | 149     | A     | H     |   |
|                         | *    | 2440.331  | 83.9       | -      | -      | 84.52    | 27.37    | 6.04   | 34.03  | 131    | 149     | P     | H     |   |
|                         | *    | 2440.08   | 83.04      | -      | -      | 83.66    | 27.37    | 6.04   | 34.03  | 131    | 149     | A     | H     |   |
|                         |      |           | 2492.92    | 51.13  | -22.87 | 74       | 51.54    | 27.5   | 6.09   | 34     | 131     | 149   | P     | H |
|                         |      |           | 2493.76    | 40.2   | -13.8  | 54       | 40.61    | 27.5   | 6.09   | 34     | 131     | 149   | A     | H |
|                         |      |           | 2388.12    | 50.24  | -23.76 | 74       | 51.04    | 27.23  | 6.01   | 34.04  | 100     | 112   | P     | V |
|                         |      |           | 2385.06    | 39.81  | -14.19 | 54       | 40.65    | 27.19  | 6.01   | 34.04  | 100     | 112   | A     | V |
|                         | *    |           | 2439.83    | 85.98  | -      | -        | 86.6     | 27.37  | 6.04   | 34.03  | 100     | 112   | P     | V |
|                         | *    |           | 2440.08    | 85.13  | -      | -        | 85.75    | 27.37  | 6.04   | 34.03  | 100     | 112   | A     | V |
|                         |      |           | 2498       | 50.5   | -23.5  | 74       | 50.91    | 27.5   | 6.09   | 34     | 100     | 112   | P     | V |
|                         |      |           | 2492.96    | 40.2   | -13.8  | 54       | 40.61    | 27.5   | 6.09   | 34     | 100     | 112   | A     | V |



|                                  |   |          |       |        |    |       |       |      |       |     |     |   |   |
|----------------------------------|---|----------|-------|--------|----|-------|-------|------|-------|-----|-----|---|---|
| <b>BLE<br/>CH 39<br/>2480MHz</b> | *   | 2479.826 | 83.29 | -      | -  | 83.77 | 27.46 | 6.07 | 34.01 | 100 | 147 | P | H |
|                                  | *   | 2480.076 | 82.36 | -      | -  | 82.84 | 27.46 | 6.07 | 34.01 | 100 | 147 | A | H |
|                                  |   | 2489.4   | 51.24 | -22.76 | 74 | 51.66 | 27.5  | 6.09 | 34.01 | 100 | 147 | P | H |
|                                  |   | 2483.52  | 40.21 | -13.79 | 54 | 40.67 | 27.46 | 6.09 | 34.01 | 100 | 147 | A | H |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | H |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | H |
|                                  | *   | 2479.993 | 85.78 | -      | -  | 86.26 | 27.46 | 6.07 | 34.01 | 113 | 119 | P | V |
|                                  | *   | 2480.076 | 85.03 | -      | -  | 85.51 | 27.46 | 6.07 | 34.01 | 113 | 119 | A | V |
|                                  |   | 2483.68  | 50.87 | -23.13 | 74 | 51.33 | 27.46 | 6.09 | 34.01 | 113 | 119 | P | V |
|                                  |   | 2483.56  | 40.27 | -13.73 | 54 | 40.73 | 27.46 | 6.09 | 34.01 | 113 | 119 | A | V |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | V |
|                                  |   |          |       |        |    |       |       |      |       |     |     |   | V |
| Remark                           | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |          |       |        |    |       |       |      |       |     |     |   |   |





2.4GHz 2400~2483.5MHz

BLE (Harmonic @ 3m)

| BLE                     | Note  | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak    | Pol.    |
|-------------------------|---|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|---------|---------|
|                         |   | ( MHz )   | ( dBμV/m ) | ( dB ) | Limit      | Level    | Factor   | Loss   | Factor | Pos    | Pos     | Avg.    |         |
|                         |   | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | ( P/A ) | ( H/V ) |
| BLE<br>CH 00<br>2402MHz |   | 4806      | 47.76      | -26.24 | 74         | 72.9     | 31.3     | 8.65   | 65.09  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4806      | 47.56      | -26.44 | 74         | 72.7     | 31.3     | 8.65   | 65.09  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| BLE<br>CH 19<br>2440MHz |   | 4878      | 47.53      | -26.47 | 74         | 72.45    | 31.41    | 8.69   | 65.02  | 100    | 0       | P       | H       |
|                         |   | 7320      | 46.33      | -27.67 | 74         | 64.69    | 36.32    | 10.39  | 65.07  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4878      | 48.84      | -25.16 | 74         | 73.76    | 31.41    | 8.69   | 65.02  | 100    | 0       | P       | V       |
|                         |   | 7320      | 42.83      | -31.17 | 74         | 61.19    | 36.32    | 10.39  | 65.07  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| BLE<br>CH 39<br>2480MHz |   | 4962      | 44.91      | -29.09 | 74         | 69.47    | 31.54    | 8.83   | 64.93  | 100    | 0       | P       | H       |
|                         |   | 7440      | 43.42      | -30.58 | 74         | 61.4     | 36.59    | 10.52  | 65.09  | 100    | 0       | P       | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | H       |
|                         |   | 4962      | 47.48      | -26.52 | 74         | 72.04    | 31.54    | 8.83   | 64.93  | 100    | 0       | P       | V       |
|                         |   | 7440      | 41.4       | -32.6  | 74         | 59.38    | 36.59    | 10.52  | 65.09  | 100    | 0       | P       | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
|                         |   |           |            |        |            |          |          |        |        |        |         |         | V       |
| Remark                  | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. |           |            |        |            |          |          |        |        |        |         |         |         |



Emission below 1GHz

2.4GHz BLE (LF)

| BLE                 | Note   | Frequency | Level      | Over   | Limit      | Read     | Antenna  | Cable  | Preamp | Ant    | Table   | Peak  | Pol.  |   |
|---------------------|--|-----------|------------|--------|------------|----------|----------|--------|--------|--------|---------|-------|-------|---|
|                     |  | ( MHz )   | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |   |
| 2.4GHz<br>BLE<br>LF |  | 57.54     | 17.29      | -22.71 | 40         | 41.02    | 7.03     | 1.04   | 31.8   | 105    | 265     | P     | H     |   |
|                     |  | 111       | 14         | -29.5  | 43.5       | 33.01    | 11.49    | 1.28   | 31.78  |        |         | P     | H     |   |
|                     |  | 270.84    | 13.78      | -32.22 | 46         | 30.13    | 13.48    | 1.94   | 31.77  |        |         |       | H     |   |
|                     |  | 425.3     | 18.11      | -27.89 | 46         | 30.6     | 16.92    | 2.41   | 31.82  |        |         | P     | H     |   |
|                     |  | 551.3     | 20.99      | -25.01 | 46         | 31.96    | 18.23    | 2.77   | 31.97  |        |         | P     | H     |   |
|                     |  | 864.2     | 22.34      | -23.66 | 46         | 27.81    | 22.7     | 3.44   | 31.61  |        |         | P     | H     |   |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           |            |        |            |          |          |        |        |        |         |       |       | H |
|                     |  |           | 31.62      | 25.75  | -14.25     | 40       | 37.99    | 18.92  | 0.67   | 31.83  |         |       | P     | V |
|                     |  |           | 56.46      | 25.89  | -14.11     | 40       | 49.31    | 7.34   | 1.04   | 31.8   | 100     | 147   | P     | V |
|                     |  |           | 79.95      | 15.65  | -24.35     | 40       | 38.52    | 7.88   | 1.04   | 31.79  |         |       | P     | V |
|                     |  |           | 425.3      | 18.29  | -27.71     | 46       | 30.78    | 16.92  | 2.41   | 31.82  |         |       | P     | V |
|                     |  |           | 769        | 21.55  | -24.45     | 46       | 28.37    | 21.79  | 3.35   | 31.96  |         |       | P     | V |
|                     |  |           | 967.1      | 24.02  | -29.98     | 54       | 26.91    | 24.23  | 3.78   | 30.9   |         |       | P     | 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 per 15.209(c). |
| !   | Test result is <b>over limit</b> line.   |
| P/A | <b>Peak</b> or <b>Average</b>  |
| H/V | <b>Horizontal</b> or <b>Vertical</b>   |



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     |

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

**For Peak Limit @ 2390MHz:**

- 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)
- Over Limit(dB)  
= Level(dBμV/m) – Limit Line(dBμV/m)  
= 55.45(dBμV/m) – 74(dBμV/m)  
= -18.55(dB)

**For Average Limit @ 2390MHz:**

- 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)
- 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”.**