# Appendix A. Radiated Spurious Emission

| Test Engineer : | Nick Yu, Derreck Chen, and Ken Wu | Temperature : | 23~25°C |
|---|---|---|---|
| | | Relative Humidity : | 48~51% |

**15C 2.4GHz 2400~2483.5MHz**

**WIFI 802.11g (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) |
| 802.11g CH 11 2462MHz | * | 2457.114 | 106.55 | - | - | 100.85 | 32.26 | 7.83 | 34.39 | 100 | 11 | P | H |
| | * | 2457.615 | 96.06 | - | - | 90.36 | 32.26 | 7.83 | 34.39 | 100 | 11 | A | H |
| | | 2483.64 | 71.42 | -2.58 | 74 | 65.66 | 32.28 | 7.91 | 34.43 | 100 | 11 | P | H |
| | | 2483.52 | 51.63 | -2.37 | 54 | 45.87 | 32.28 | 7.91 | 34.43 | 100 | 11 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | * | 2468.052 | 99.55 | - | - | 93.81 | 32.26 | 7.91 | 34.43 | 176 | 88 | P | V |
| | * | 2469.305 | 89.28 | - | - | 83.54 | 32.26 | 7.91 | 34.43 | 176 | 88 | A | V |
| | | 2483.84 | 64.08 | -9.92 | 74 | 58.32 | 32.28 | 7.91 | 34.43 | 176 | 88 | P | V |
| | | 2483.52 | 47.34 | -6.66 | 54 | 41.58 | 32.28 | 7.91 | 34.43 | 176 | 88 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

**15C 2.4GHz 2400~2483.5MHz**

**WIFI 802.11g (Harmonic @ 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) |
| 802.11g CH 11 2462MHz | | 4926 | 42.17 | -31.83 | 74 | 55.29 | 34.34 | 11.27 | 58.73 | 100 | 0 | P | H |
| | | 7386 | 42.74 | -31.26 | 74 | 49.8 | 35.6 | 15.14 | 57.8 | 100 | 0 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 4926 | 42 | -32 | 74 | 55.12 | 34.34 | 11.27 | 58.73 | 100 | 0 | P | V |
| | | 7386 | 43.51 | -30.49 | 74 | 50.57 | 35.6 | 15.14 | 57.8 | 100 | 0 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | 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 WIFI 802.11g (LF)**

| 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) |
| 2.4GHz 802.11g LF | | 95.88 | 30.77 | -12.73 | 43.5 | 50.37 | 9.44 | 2.06 | 31.1 | | | P | H |
| | | 179.31 | 34.38 | -9.12 | 43.5 | 53.72 | 8.97 | 2.61 | 30.92 | | | P | H |
| | | 264.09 | 32.34 | -13.66 | 46 | 46.62 | 13.56 | 3.16 | 31 | | | P | H |
| | | 384 | 36.06 | -9.94 | 46 | 48.26 | 15.26 | 3.52 | 30.98 | | | P | H |
| | | 563.9 | 37.07 | -8.93 | 46 | 43.91 | 19.89 | 4.01 | 30.74 | 215 | 39 | P | H |
| | | 960.1 | 30.69 | -23.31 | 54 | 31.41 | 24.7 | 4.94 | 30.36 | | | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 39.99 | 28.36 | -11.64 | 40 | 43.79 | 14 | 1.77 | 31.2 | | | P | V |
| | | 115.32 | 35.08 | -8.42 | 43.5 | 52.71 | 11.13 | 2.38 | 31.14 | | | P | V |
| | | 264.09 | 32.52 | -13.48 | 46 | 46.8 | 13.56 | 3.16 | 31 | | | P | V |
| | | 384 | 34.09 | -11.91 | 46 | 46.29 | 15.26 | 3.52 | 30.98 | | | P | V |
| | | 566 | 40.09 | -5.91 | 46 | 47 | 19.81 | 4.01 | 30.73 | 143 | 201 | P | V |
| | | 941.2 | 27.98 | -18.02 | 46 | 29.11 | 24.31 | 4.94 | 30.38 | | | 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

| | |
|---|---|
| * | **Fundamental Frequency** 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 **over limit** line. |
| P/A | **P**eak or **A**verage |
| H/V | **H**orizontal or **V**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 CH 01 2412MHz | | 2390 | 55.45 | -18.55 | 74 | 54.51 | 32.22 | 4.58 | 35.86 | 103 | 308 | P | H |
| | | 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".**