



Appendix B. Radiated Spurious Emission

| | | | |
|------------------------|--|----------------------------|---------|
| Test Engineer : | Peter Chiu, Nick Yu, Ricky Su, Citta Ke and Karl Hou | Temperature : | 21~23°C |
| | | Relative Humidity : | 55~57% |

<CDD Modes>

Band 4 - 5725~5850MHz

WIFI 802.11a (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) |
| 802.11a CH 149 5745MHz | | 5633 | 55.53 | -12.77 | 68.3 | 42.55 | 32.19 | 11.79 | 31 | 265 | 14 | P | H |
| | | 5698 | 63.6 | -40.23 | 103.83 | 50.52 | 32.27 | 11.82 | 31.01 | 265 | 14 | P | H |
| | | 5718.8 | 73.44 | -37.12 | 110.56 | 60.31 | 32.31 | 11.84 | 31.02 | 265 | 14 | P | H |
| | | 5724.6 | 85.66 | -35.73 | 121.39 | 72.53 | 32.31 | 11.84 | 31.02 | 265 | 14 | P | H |
| | * | 5745 | 111.02 | - | - | 97.85 | 32.34 | 11.86 | 31.03 | 265 | 14 | P | H |
| | * | 5745 | 101.27 | - | - | 88.1 | 32.34 | 11.86 | 31.03 | 265 | 14 | A | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5639.8 | 59.71 | -8.59 | 68.3 | 46.73 | 32.19 | 11.79 | 31 | 100 | 99 | P | V |
| | | 5698.2 | 62.76 | -41.21 | 103.97 | 49.68 | 32.27 | 11.82 | 31.01 | 100 | 99 | P | V |
| | | 5720 | 71.21 | -39.69 | 110.9 | 58.08 | 32.31 | 11.84 | 31.02 | 100 | 99 | P | V |
| | | 5724.4 | 81.91 | -39.02 | 120.93 | 68.78 | 32.31 | 11.84 | 31.02 | 100 | 99 | P | V |
| | * | 5745 | 107.38 | - | - | 94.21 | 32.34 | 11.86 | 31.03 | 100 | 99 | P | V |
| | * | 5745 | 97.6 | - | - | 84.43 | 32.34 | 11.86 | 31.03 | 100 | 99 | A | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |



| WIFI Ant. 1 | Note | Frequency (MHz) | Level (dBμV/m) | Over Limit (dB) | Limit Line (dBμV/m) | Read Level (dBμV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) |
|------------------------------|------|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11a CH 157 5785MHz | | 5609.6 | 59.44 | -8.86 | 68.3 | 46.52 | 32.14 | 11.77 | 30.99 | 251 | 18 | P | H |
| | | 5685.6 | 59.88 | -34.8 | 94.68 | 46.8 | 32.27 | 11.82 | 31.01 | 251 | 18 | P | H |
| | | 5718.4 | 60.57 | -49.88 | 110.45 | 47.44 | 32.31 | 11.84 | 31.02 | 251 | 18 | P | H |
| | | 5723.8 | 60.64 | -58.92 | 119.56 | 47.51 | 32.31 | 11.84 | 31.02 | 251 | 18 | P | H |
| | * | 5783 | 109.99 | - | - | 96.77 | 32.39 | 11.88 | 31.05 | 251 | 18 | P | H |
| | * | 5783 | 100.57 | - | - | 87.35 | 32.39 | 11.88 | 31.05 | 251 | 18 | A | H |
| | | 5850 | 60.06 | -62.24 | 122.3 | 46.61 | 32.48 | 12.03 | 31.06 | 251 | 18 | P | H |
| | | 5859.2 | 60.66 | -49.06 | 109.72 | 47.19 | 32.51 | 12.03 | 31.07 | 251 | 18 | P | H |
| | | 5922 | 60.69 | -9.82 | 70.51 | 46.87 | 32.6 | 12.31 | 31.09 | 251 | 18 | P | H |
| | | 5925.4 | 61.18 | -7.12 | 68.3 | 47.36 | 32.6 | 12.31 | 31.09 | 251 | 18 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 5604.6 | 59.67 | -8.63 | 68.3 | 46.75 | 32.14 | 11.77 | 30.99 | 100 | 105 | P | V |
| | | 5696.2 | 60.32 | -42.18 | 102.5 | 47.24 | 32.27 | 11.82 | 31.01 | 100 | 105 | P | V |
| | | 5705 | 59.91 | -46.79 | 106.7 | 46.8 | 32.29 | 11.84 | 31.02 | 100 | 105 | P | V |
| | | 5723.6 | 59.74 | -59.37 | 119.11 | 46.61 | 32.31 | 11.84 | 31.02 | 100 | 105 | P | V |
| | * | 5783 | 106.51 | - | - | 93.29 | 32.39 | 11.88 | 31.05 | 100 | 105 | P | V |
| | * | 5783 | 96.99 | - | - | 83.77 | 32.39 | 11.88 | 31.05 | 100 | 105 | A | V |
| | | 5853.8 | 61.4 | -52.24 | 113.64 | 47.92 | 32.51 | 12.03 | 31.06 | 100 | 105 | P | V |
| | | 5858 | 60.24 | -49.82 | 110.06 | 46.77 | 32.51 | 12.03 | 31.07 | 100 | 105 | P | V |
| | | 5888 | 60.51 | -35.14 | 95.65 | 46.86 | 32.56 | 12.17 | 31.08 | 100 | 105 | P | V |
| | | 5942.2 | 60.05 | -8.25 | 68.3 | 46.06 | 32.63 | 12.45 | 31.09 | 100 | 105 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |



| WIFI Ant. 1 | Note | Frequency (MHz) | Level (dBμV/m) | Over Limit (dB) | Limit Line (dBμV/m) | Read Level (dBμV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) |
|---------------------------------------|---|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11a CH 165 5825MHz | * | 5825 | 112.35 | - | - | 98.91 | 32.46 | 12.03 | 31.05 | 267 | 15 | P | H |
| | * | 5825 | 102.15 | - | - | 88.71 | 32.46 | 12.03 | 31.05 | 267 | 15 | A | H |
| | | 5851.4 | 76.17 | -42.94 | 119.11 | 62.72 | 32.48 | 12.03 | 31.06 | 267 | 15 | P | H |
| | | 5856.2 | 73.25 | -37.31 | 110.56 | 59.77 | 32.51 | 12.03 | 31.06 | 267 | 15 | P | H |
| | | 5879.4 | 65.79 | -36.24 | 102.03 | 52.16 | 32.53 | 12.17 | 31.07 | 267 | 15 | P | H |
| | | 5947.2 | 61.33 | -6.97 | 68.3 | 47.34 | 32.63 | 12.45 | 31.09 | 267 | 15 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | * | 5830 | 107.98 | - | - | 94.54 | 32.46 | 12.03 | 31.05 | 100 | 98 | P | V |
| | * | 5830 | 97.84 | - | - | 84.4 | 32.46 | 12.03 | 31.05 | 100 | 98 | A | V |
| | | 5850 | 73.6 | -48.7 | 122.3 | 60.15 | 32.48 | 12.03 | 31.06 | 100 | 98 | P | V |
| | | 5856.4 | 69.35 | -41.16 | 110.51 | 55.87 | 32.51 | 12.03 | 31.06 | 100 | 98 | P | V |
| | | 5880 | 63.19 | -38.4 | 101.59 | 49.56 | 32.53 | 12.17 | 31.07 | 100 | 98 | P | V |
| | | 5936.4 | 61.04 | -7.26 | 68.3 | 47.22 | 32.6 | 12.31 | 31.09 | 100 | 98 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |



Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

| WIFI Ant. 1 | Note | Frequency (MHz) | Level (dBμV/m) | Over Limit (dB) | Limit Line (dBμV/m) | Read Level (dBμV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamp Factor (dB) | Ant Pos (cm) | Table Pos (deg) | Peak Avg. (P/A) | Pol. (H/V) |
|------------------------------|---|----------------------|---------------------|-------------------------|-----------------------------|---------------------------|-------------------------------|-------------------------|----------------------------|----------------------|-------------------------|-------------------------|-----------------|
| 802.11a CH 149 5745MHz | | 11490 | 47.25 | -26.75 | 74 | 46.52 | 40.11 | 18.4 | 57.78 | 100 | 0 | P | H |
| | | 17235 | 48.84 | -19.46 | 68.3 | 41.19 | 41.65 | 23.14 | 57.14 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11490 | 46.9 | -27.1 | 74 | 46.17 | 40.11 | 18.4 | 57.78 | 100 | 0 | P | V |
| | | 17235 | 49.41 | -18.89 | 68.3 | 41.76 | 41.65 | 23.14 | 57.14 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11a CH 157 5785MHz | | 11570 | 47.51 | -26.49 | 74 | 46.87 | 39.95 | 18.49 | 57.8 | 100 | 0 | P | H |
| | | 17355 | 49.52 | -18.78 | 68.3 | 41.81 | 42.02 | 23.25 | 57.56 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11570 | 48.61 | -25.39 | 74 | 47.97 | 39.95 | 18.49 | 57.8 | 100 | 0 | P | V |
| | | 17355 | 50.01 | -18.29 | 68.3 | 42.3 | 42.02 | 23.25 | 57.56 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| 802.11a CH 165 5825MHz | | 11650 | 47 | -27 | 74 | 46.42 | 39.8 | 18.58 | 57.8 | 100 | 0 | P | H |
| | | 17475 | 58.01 | -10.29 | 68.3 | 50.24 | 42.39 | 23.36 | 57.98 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 11650 | 47.85 | -26.15 | 74 | 47.27 | 39.8 | 18.58 | 57.8 | 100 | 0 | P | V |
| | | 17475 | 50.41 | -17.89 | 68.3 | 42.64 | 42.39 | 23.36 | 57.98 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 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) |
| 5GHz 802.11a LF | | 201.45 | 24.84 | -18.66 | 43.5 | 39.7 | 15.85 | 1.7 | 32.41 | - | - | P | H |
| | | 231.69 | 25.97 | -20.03 | 46 | 39.61 | 16.88 | 1.83 | 32.35 | - | - | P | H |
| | | 291.9 | 27.22 | -18.78 | 46 | 37.87 | 19.34 | 2.25 | 32.24 | - | - | P | H |
| | | 360.9 | 31.06 | -14.94 | 46 | 39.68 | 21.26 | 2.44 | 32.32 | - | - | P | H |
| | | 906.9 | 31.68 | -14.32 | 46 | 29.5 | 29.09 | 4.6 | 31.51 | - | - | P | H |
| | | 949.6 | 32.99 | -13.01 | 46 | 29.07 | 30.3 | 4.75 | 31.13 | 100 | 81 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 31.89 | 36.25 | -3.75 | 40 | 43.21 | 24.72 | 0.78 | 32.46 | 100 | 119 | P | V |
| | | 64.83 | 25.97 | -14.03 | 40 | 45.31 | 12.05 | 1.06 | 32.45 | - | - | P | V |
| | | 199.29 | 26.99 | -16.51 | 43.5 | 41.9 | 15.8 | 1.7 | 32.41 | - | - | P | V |
| | | 353.9 | 33.12 | -12.88 | 46 | 41.9 | 21.09 | 2.44 | 32.31 | - | - | P | V |
| | | 484.8 | 28.01 | -17.99 | 46 | 33.61 | 23.72 | 3.08 | 32.4 | - | - | P | V |
| | | 946.8 | 33.73 | -12.27 | 46 | 29.92 | 30.22 | 4.75 | 31.16 | - | - | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | V | |
| | | | | | | | | | | | | V | |
| | | | | | | | | | | | | V | |
| | | | | | | | | | | | | V | |
| Remark | 1. No other spurious found. 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. |
| ! | Test result is over limit line. |
| P/A | Peak or Average |
| H/V | Horizontal or Vertical |



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”.