



Appendix A. Radiated Spurious Emission

| | | | |
|-----------------|--------------|---------------------|---------|
| Test Engineer : | Derreck Chen | Temperature : | 22~23°C |
| | | Relative Humidity : | 45~47% |

2.4GHz 2400~2483.5MHz

BT (Band Edge @ 3m)

| BT | 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) | |
| BT CH00 2402MHz | | 2361.74 | 49.25 | -24.75 | 74 | 50.21 | 27.14 | 5.95 | 34.05 | 382 | 128 | P | H | |
| | | 2361.74 | 24.49 | -29.51 | 54 | - | - | - | - | - | - | A | H | |
| | * | 2402.04 | 103.58 | - | - | 104.38 | 27.23 | 6.01 | 34.04 | 382 | 128 | P | H | |
| | * | 2402.04 | 78.82 | - | - | - | - | - | - | - | - | A | H | |
| | | | | | | | | | | | | | H | |
| | | | | | | | | | | | | | H | |
| | | | 2362.26 | 46.26 | -27.74 | 74 | 47.22 | 27.14 | 5.95 | 34.05 | 191 | 329 | P | V |
| | | | 2362.26 | 21.5 | -32.5 | 54 | - | - | - | - | - | - | A | V |
| | * | | 2402.17 | 104.68 | - | - | 105.48 | 27.23 | 6.01 | 34.04 | 191 | 329 | P | V |
| | * | | 2402.17 | 79.92 | - | - | - | - | - | - | - | - | A | V |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| BT CH 39 2441MHz | | 2374.6 | 43.3 | -30.7 | 74 | 44.14 | 27.19 | 6.01 | 34.04 | 226 | 130 | P | H | |
| | | 2374.6 | 18.54 | -35.46 | 54 | - | - | - | - | - | - | A | H | |
| | * | 2441.1 | 103.64 | - | - | 104.25 | 27.37 | 6.04 | 34.02 | 226 | 130 | P | H | |
| | * | 2441.1 | 78.88 | - | - | - | - | - | - | - | - | A | H | |
| | | | 2487.08 | 46.8 | -27.2 | 74 | 47.26 | 27.46 | 6.09 | 34.01 | 226 | 130 | P | H |
| | | | 2487.08 | 22.04 | -31.96 | 54 | - | - | - | - | - | - | A | H |
| | | | 2389.8 | 43.96 | -30.04 | 74 | 44.76 | 27.23 | 6.01 | 34.04 | 155 | 341 | P | V |
| | | | 2389.8 | 19.2 | -34.8 | 54 | - | - | - | - | - | - | A | V |
| | * | | 2441.1 | 105.19 | - | - | 105.8 | 27.37 | 6.04 | 34.02 | 155 | 341 | P | V |
| | * | | 2441.1 | 80.43 | - | - | - | - | - | - | - | - | A | V |
| | | | 2498.29 | 46.44 | -27.56 | 74 | 46.85 | 27.5 | 6.09 | 34 | 155 | 341 | P | V |
| | | 2498.29 | 21.68 | -32.32 | 54 | - | - | - | - | - | - | A | V | |



| BT | 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) | |
| BT CH 78 2480MHz | * | 2480.05 | 103.68 | - | - | 104.16 | 27.46 | 6.07 | 34.01 | 221 | 129 | P | H | |
| | * | 2480.05 | 78.92 | - | - | - | - | - | - | - | - | A | H | |
| | | 2483.5 | 47.79 | -26.21 | 74 | 48.25 | 27.46 | 6.09 | 34.01 | 221 | 129 | P | H | |
| | | 2483.5 | 23.03 | -30.97 | 54 | - | - | - | - | - | - | A | H | |
| | | | | | | | | | | | | | H | |
| | | | | | | | | | | | | | H | |
| | * | 2479.98 | 105.32 | - | - | 105.8 | 27.46 | 6.07 | 34.01 | 137 | 342 | P | V | |
| | * | 2479.98 | 80.56 | - | - | - | - | - | - | - | - | - | A | V |
| | | 2483.5 | 49.44 | -24.56 | 74 | 49.9 | 27.46 | 6.09 | 34.01 | 137 | 342 | P | V | |
| | | 2483.5 | 24.68 | -29.32 | 54 | - | - | - | - | - | - | A | V | |
| | | | | | | | | | | | | | V | |
| | | | | | | | | | | | | | V | |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | | |



2.4GHz 2400~2483.5MHz
BT (Harmonic @ 3m)

| BT | 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) | |
| BT CH 00 2402MHz | | 4806 | 44.81 | -29.19 | 74 | 38.41 | 31.3 | 8.65 | 33.55 | 150 | 0 | P | H | |
| | | 4806 | 20.05 | -33.95 | 54 | - | - | - | - | - | - | A | H | |
| | | | | | | | | | | | | | H | |
| | | | | | | | | | | | | | H | |
| | | 4806 | 49.47 | -24.53 | 74 | 43.07 | 31.3 | 8.65 | 33.55 | 150 | 0 | P | V | |
| | | 4806 | 24.71 | -29.29 | 54 | - | - | - | - | - | - | - | A | V |
| | | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | | V |
| BT CH 39 2441MHz | | 4884 | 44.92 | -29.08 | 74 | 38.31 | 31.41 | 8.74 | 33.54 | 150 | 0 | P | H | |
| | | 4884 | 20.16 | -33.84 | 54 | - | - | - | - | - | - | A | H | |
| | | 7323 | 50.89 | -23.11 | 74 | 38.59 | 36.32 | 10.44 | 34.46 | 150 | 0 | P | H | |
| | | 7323 | 26.13 | -27.87 | 54 | - | - | - | - | - | - | A | H | |
| | | 4882 | 47.87 | -26.13 | 74 | 41.26 | 31.41 | 8.74 | 33.54 | 150 | 0 | P | V | |
| | | 4882 | 23.11 | -30.89 | 54 | - | - | - | - | - | - | A | V | |
| | | 7323 | 49.83 | -24.17 | 74 | 37.53 | 36.32 | 10.44 | 34.46 | 150 | 0 | P | V | |
| | | 7323 | 25.07 | -28.93 | 54 | - | - | - | - | - | - | A | V | |
| BT CH 78 2480MHz | | 4962 | 45.46 | -28.54 | 74 | 38.63 | 31.54 | 8.83 | 33.54 | 150 | 0 | P | H | |
| | | 4962 | 20.7 | -33.3 | 54 | - | - | - | - | - | - | A | H | |
| | | 7440 | 50.66 | -23.34 | 74 | 38.07 | 36.59 | 10.52 | 34.52 | 150 | 0 | P | H | |
| | | 7440 | 25.9 | -28.1 | 54 | - | - | - | - | - | - | A | H | |
| | | 4962 | 46.26 | -27.74 | 74 | 39.43 | 31.54 | 8.83 | 33.54 | 150 | 0 | P | V | |
| | | 4962 | 21.5 | -32.5 | 54 | - | - | - | - | - | - | A | V | |
| | | 7440 | 50.69 | -23.31 | 74 | 38.1 | 36.59 | 10.52 | 34.52 | 150 | 0 | P | V | |
| | | 7440 | 25.93 | -28.07 | 54 | - | - | - | - | - | - | A | V | |
| Remark | 1. No other spurious found. 2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | | |



Emission below 1GHz

2.4GHz BT (LF)

| BT | 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 BT LF | | 49.71 | 13.07 | -26.93 | 40 | 36.03 | 7.8 | 1.04 | 31.8 | | | P | H | |
| | | 122.34 | 17.8 | -25.7 | 43.5 | 36.85 | 11.45 | 1.28 | 31.78 | | | P | H | |
| | | 245.73 | 19.42 | -26.58 | 46 | 37.76 | 11.49 | 1.94 | 31.77 | | | P | H | |
| | | 451.2 | 24.5 | -21.5 | 46 | 37.27 | 16.51 | 2.57 | 31.85 | 137 | 122 | P | H | |
| | | 743.1 | 21.69 | -24.31 | 46 | 30.63 | 19.8 | 3.25 | 31.99 | | | P | H | |
| | | 824.3 | 23.29 | -22.71 | 46 | 31.59 | 20.1 | 3.4 | 31.8 | | | P | H | |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | | H |
| | | | 69.69 | 18.55 | -21.45 | 40 | 44.13 | 5.17 | 1.04 | 31.79 | 193 | 218 | P | V |
| | | | 132.06 | 18.45 | -25.05 | 43.5 | 37.33 | 11.44 | 1.46 | 31.78 | | | P | V |
| | | | 231.96 | 13.26 | -32.74 | 46 | 33.5 | 9.74 | 1.79 | 31.77 | | | P | V |
| | | | 332.9 | 19.47 | -26.53 | 46 | 35.41 | 13.66 | 2.17 | 31.77 | | | P | V |
| | | | 559 | 22.12 | -23.88 | 46 | 32.81 | 18.52 | 2.77 | 31.98 | | | P | V |
| | | | 835.5 | 22.06 | -23.94 | 46 | 30.25 | 20.16 | 3.4 | 31.75 | | | 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 per 15.209(c). |
| ! | 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+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”.