Exhibit: RF Exposure – FCC

FCC ID: WR955470766937

Report File #: 7169010244R-000

RF Exposure – FCC

The device is a mobile device intended to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure and the body of the user or nearby persons.

The EUT contains a 902 – 928 MHz FHSS/Hybrid transmitter and a 2400 – 2483.5 MHz DTS transmitter. The Firmware guarantees simultaneous will not occur. Antenna co-location evaluation is therefore not applicable.

RF Exposure Exemption Evaluation: Mobile Devices

Mobile devices are exempted from routine MPE evaluation based on guidance provided in FCC §1.1307 (b)(3)(i)(C) for devices operating from 300 kHz to 100 GHz with a minimum separation distance of $\lambda/2\pi$ and with an ERP lower than the Threshold ERP.

The Threshold ERP is given in Table 1 to § 1.1307(b)(3)(i)(C).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

Where R is the separation distance in meters and f is in MHz.

The table below lists the minimum separation distance $\lambda/2\pi$ for the lowest channel of operation for the of the transmitters.

RF Source frequency (MHz)	Minimum separation Distance (cm)
920	5.19
2402	1.99
2412	1.98
5180	0.92
5475	0.87
24054	0.20

The declared separation distance by the client is 20 cm.

The table below lists the Threshold ERP at 20 cm for the lowest channel of operation for the FHSS/Hybrid transmitter and for the DTS transmitter.

RF Source frequency (MHz)	Threshold ERP (watts)	Threshold ERP (mW)	Threshold ERP (dBm)
920	0.471	471.0	26.73
2402	0.768	768.0	28.85
2412	0.768	768.0	28.85
5180	0.768	768.0	28.85
5475	0.768	768.0	28.85
24054	0.768	768.0	28.85

Given that EIRP = P_{out} + G and ERP = EIRP – 2.15

Therefore, ERP = P_{out} + G – 2.15

Threshold ERP Calculation

Transmitter	Frequency (MHz)	Power (dBm)	Antenna (dBi)	ERP (dBm)	ERP (W)	Limit (W)
FHSS/Hybrid	920	19.10	-1.8	15.15	0.0327	0.471
BT	2402	9.97	1.5	9.32	0.0085	0.768
BLE	2402	11.08	1.5	10.43	0.0110	0.768
Thread	2401.6	12.64	3.0	13.49	0.0223	0.768
WIFI	2412	22.95	3.0	23.80	0.2399	0.768
WIFI	5180	19.67	-0.8	16.72	0.0470	0.768
WIFI	5475	22.37	-0.8	19.42	0.0875	0.768
Radar	24000	-2.74		-4.89	0.0003	0.768

Notes:
The 24.05 – 24.24 GHz transmitter has a peak emission of 89.76 dBuV/m at 3 m. Applying the 3 m dBuV/m to EIRP conversion factor of 95.2; the transmitter has a peak EIRP of -2.74 dBm.

Conclusion

All transmitters qualify for standalone testing exemption.

Simultaneous Transmission

The transmitters on the EUT are located on different SoC. Bluetooth, and all three bands of WLAN are on SoC1. Thread and 900 MHz transmitter are on SoC2. The 2.4 GHz Bluetooth share the same antenna as the 2.4 GHz WLAN and the two 5.2GHz and 5.8 GHz WLAN share an antenna. The 2.4 GHz Thread and 900 MHz have different antennas.

Each SoC could only transmit one mode at a time. Thus, the worst-case RF exposure are a combination of the highest ERP from each SoC. The highest ERP from SoC1 is 0.240 W and from SoC2 is 0.033 W.

To qualify for simultaneous exemption, the sum of the ERP/Threshold ratio must be less than 1.

$0.033/0.471 + 0.240/0.768 + 0.0003/0.768 = 0.4 < 1$

The EUT qualifies for simultaneous transmission.