APPENDIX I
RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.247(i), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this chapter.

EUT Specification

EUT	Compact Monitoring Gateway
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ WLAN: 5.18GHz ~ 5.32GHz / 5.50GHz ~ 5.70GHz ☐ WLAN: 5.745GHz ~ 5.825GHz ☐ Others
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm^2) ☒ General Population/Uncontrolled exposure (S=1mW/cm^2)

Antenna diversity	☒ Single antenna
	☐ Multiple antennas
	   ☐ Tx diversity
	   ☐ Rx diversity
	   ☐ Tx/Rx diversity

Max. output power	IEEE 802.11b: 15.45 dBm (35.08mW) IEEE 802.11g: 13.37 dBm (21.73mW)
Antenna gain (Max)	3.29 dBi (Numeric gain: 2.13)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation

Remark:
1. *The maximum output power is <u>15.45dBm (35.08mW)</u> at <u>2412MHz</u> (with <u>2.13 numeric antenna gain</u>.)*
2. *DTS device is not subject to routine RF evaluation; MPE estimate is used to justify the compliance.*
3. *For mobile or fixed location transmitters, no SAR consideration applied. The maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.*

TEST RESULTS

No non-compliance noted.

Calculation

Given $\quad E = \dfrac{\sqrt{30 \times P \times G}}{d} \quad$ & $\quad S = \dfrac{E^2}{3770}$

Where $\quad E = Field\ strength\ in\ Volts\ /\ meter$

$P = Power\ in\ Watts$

$G = Numeric\ antenna\ gain$

$d = Distance\ in\ meters$

$S = Power\ density\ in\ milliwatts\ /\ square\ centimeter$

Combining equations and re-arranging the terms to express the distance as a function of the remaining variables yields:

$$S = \frac{30 \times P \times G}{3770d^2}$$

Changing to units of mW and cm, using:

$P\ (mW) = P\ (W)\ /\ 1000\ and$

$d\ (cm) = d(m)\ /\ 100$

Yields

$$S = \frac{30 \times (P/1000) \times G}{3770 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \textbf{\textit{Equation 1}}$$

Where $\quad d = Distance\ in\ cm$

$P = Power\ in\ mW$

$G = Numeric\ antenna\ gain$

$S = Power\ density\ in\ mW\ /\ cm^2$

Maximum Permissible Exposure

EUT output power = 35.08mW

Numeric Antenna gain = 2.13

Substituting the MPE safe distance using d = 20 cm into Equation 1:

Yields

$$S = 0.000199 \times P \times G$$

Where $\quad P = Power\ in\ mW$

$G = Numeric\ antenna\ gain$

$S = Power\ density\ in\ mW\ /\ cm^2$

→ *Power density = 0.0149 mW / cm²*

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm² even if the calculation indicates that the power density would be larger.)