FCC RF EXPOSURE REPORT

EUT	ZigBee Mini Hub
Frequency band (Operating)	☒ WLAN: 2.405GHz ~ 2.475GHz ☐ WLAN: 2.422GHz ~ 2.452GHz ☐ WLAN: 5.180GHz ~ 5.240GHz ☐ WLAN: 5.190GHz ~ 5.230GHz
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation)
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	15.69dBm (37.068mW)
Antenna gain (Max)	1.3dBi(Numeric gain:1.35)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Note:

1. *The maximum output power is 15.69dBm (37.068mW) at 2405MHz (with numeric 1.35 antenna gain.)*
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 $E = \dfrac{\sqrt{30 \times P \times G}}{d}$ & $S = \dfrac{E^2}{3770}$

> Where 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:

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

Changing to units of mW and cm, using:

> P (mW) = P (W) / 1000 and
> d (cm) = d(m) /100

Yields

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

> Where d = Distance in cm
> P = Power in mW
> G = Numeric antenna gain
> S = Power density in mW / cm²

Maximum Permissible Exposure

EUT Output Power=37.068mW

Numeric antenna gain=1.35

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

Yields

The power density $=9.955 \times 10^{-3} \text{mW/cm}^2$

(For mobile or fixed location transmitters, the maximum power density is 1.0 mW/cm^2 even if the calculation indicates that the power density would be larger.)