APPENDIX I RADIO FREQUENCY EXPOSURE

LIMIT

According to §15.407(f), U-NII devices are subject to the radio frequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091 and 2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a "general population/uncontrolled" environment. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

EUT Specification

EUT	Sengled Snap Gen2
Frequency band (Operating)	☒ WLAN: 2.412GHz ~ 2.462GHz ☐ Others: _____
Device category	☐ Portable (<20cm separation) ☒ Mobile (>20cm separation) ☐ Others: _____
Exposure classification	General Population/Uncontrolled exposure (S=1mW/cm2)
Antenna diversity	☐ Single antenna ☒ Multiple antennas ☐ Tx diversity ☐ Rx diversity ☒ Tx/Rx diversity
Max. output power	IEEE 802.11b mode: 20.39dBm IEEE 802.11g mode: 23.41 dBm IEEE 802.11n HT20 mode: 25.95dBm IEEE 802.11n HT40 mode: 24.08dBm
Antenna gain (Max)	Antenna 1 gain:6.63dBi(Numeric gain: 4.603) Antenna 2 gain:4.83dBi(Numeric gain: 3.041) Directional antenna gain:8.83dBi (Numeric gain: 7.638)
Evaluation applied	☒ MPE Evaluation ☐ SAR Evaluation* ☐ N/A

Remark:

1. The maximum output power is 25.95 dBm (393.55mW) at 2462MHz (with 7.638 numeric 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/cm2 even if the calculation indicates that the power density would be larger.*

TEST RESULTS

No non-compliance noted.

Calculation

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

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

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

Where *d = Distance in cm*
P = Power in mW
G = Numeric antenna gain
S = Power density in mW / cm^2

Maximum Permissible Exposure

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

Yields

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

Where *P = Power in mW*
G = Numeric antenna gain
S = Power density in mW / cm^2

Modulation Mode	Frequency band (MHz)	Max. tune up power(dBm)	Antenna gain (dBi)	Distance (cm)	Power density (mW/cm2)	Limit (mW/cm2)
IEEE802.11b	2412-2462	20.5	6.63	20	0.103	1
IEEE802.11g		23.5	6.63	20	0.205	1
IEEE802.11 n(20MHz)		26.0	8.83	20	0.598	1
IEEE802.11 n(40MHz)	2422-2452	24.5	8.83	20	0.389	1

Note:
Only the 2.4G can transmit, the formula of calculated the MPE is:
CPD1 / LPD1 < 1
CPD = Calculation power density
LPD = Limit of power density

2.4G Max Power density =0.598 < 1
(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.)

END OF REPORT