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	802.11ac Dual Band In Ceiling WAP		
Model	DA1104		
RF Module	Realtek	Model:	2.4GHz：RTL8192ER 5GHz：RTL8812AR
Frequency band (Operating)	☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz 802.11n HT40: 2.422GHz ~ 2.452GHz 802.11a: 5150 ~ 5250MHz / 5725 ~ 5850MHz 802.11 HT20: 5150 ~ 5250MHz / 5725 ~ 5850MHz 802.11 HT40: 5150 ~ 5250MHz / 5725 ~ 5850MHz 802.11AC HT80: 5170 ~ 5330 MHZ / 5490 ~ 5815 MHZ ☐ 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 Specification	5GHz: Antenna Gain : 4.00 dBi (Numeric gain 2.51) 2.4GHz: Antenna Gain : 2.50 dBi (Numeric gain 1.78)		
Maximum Average output power	IEEE 802.11b Mode: 17.86 dBm (61.094 mW) IEEE 802.11g Mode: 12.70 dBm (18.621 mW) IEEE 802.11n HT 20 Mode 13.00 dBm (19.953 mW) IEEE 802.11n HT 40 Mode 13.16 dBm (20.701 mW) IEEE 802.11a Mode: 11.62 dBm (14.521 mW) IEEE 802.11n HT20 Mode 15.35 dBm (34.277 mW) IEEE 802.11n HT40 Mode 15.26 dBm (33.574 mW) IEEE 802.11ac HT80 Mod 15.18 dBm (32.961 mW)		

Maximum Tune up Power	IEEE 802.11b Mode: 19.50 dBm (89.125 mW) IEEE 802.11g Mode: 14.50 dBm (28.184 mW) IEEE 802.11n HT 20 Mode 14.50 dBm (28.184 mW) IEEE 802.11n HT 40 Mode 15.00 dBm (31.623 mW) IEEE 802.11a Mode: 13.50 dBm (22.387 mW) IEEE 802.11n HT20 Mode: 17.00 dBm (50.119 mW) IEEE 802.11n HT40 Mode: 17.00 dBm (50.119 mW) IEEE 802.11ac HT80 Mod 17.00 dBm (50.119 mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2014/12/22	Initial Issue	ALL	Doris Chu

TEST RESULTS

No non-compliance noted.

Calculation

Given $E = \frac{\sqrt{30 \times P \times G}}{d}$ & $S = \frac{E^2}{377}$

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:

$$S = \frac{30 \times P \times G}{377 d^2}$$

Changing to units of mW and cm, using:

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

d (cm) = d(m) / 100

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2}$$ ***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:

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

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

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
11	2462	89.125	1.78	20	0.0316	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	28.184	1.78	20	0.0100	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
1	2412	28.184	1.78	20	0.0100	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
3	2422	31.623	1.78	20	0.0112	1

IEEE 802.11a mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
149	5745	22.387	2.51	20	0.0112	1

IEEE 802.11a HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
48	5240	50.119	2.51	20	0.0250	1

IEEE 802.11a HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
46	5230	50.119	2.51	20	0.0250	1

IEEE 802.11ac HT80 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
155	5775	50.119	2.51	20	0.0250	1