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	**Product name**		**Model**
	Enterprise Access Point		EAP706; EAP705
Model	Wireless Hotspot Gateway		HSG326; HSG325
	Cluster Access Point		CAP326; CAP325
Brand	4ipnet		
RF Module	MediaTek	**Model:**	2.4G: MT7603E 5G: MT7612E
Frequency band (Operating)	☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz 802.11n HT40: 2.422GHz ~ 2.452GHz ☒ 802.11a, 802.11n HT20 : 5180MHz ~ 5240MHz; 5745 ~ 5825MHz 802.11n HT40 : 5190MHz ~ 5230MHz; 5755 ~ 5795MHz 802.11ac VHT80 : 5210MHz; 5755MHz ☐ 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	Antenna Gain 2.4GHz	2.7 dBi	(Numeric gain: 1.86)
	Antenna Gain 5GHz	3.2 dBi	(Numeric gain: 2.09)
Maximum Average output power	IEEE 802.11b Mode :	17.27 dBm	(53.333 mW)
	IEEE 802.11g Mode :	20.50 dBm	(112.202 mW)
	IEEE 802.11n HT20 Mode :	17.73 dBm	(59.293 mW)
	IEEE 802.11n HT40 Mode :	15.15 dBm	(32.734 mW)
	IEEE 802.11a Mode :	17.05 dBm	(50.699 mW)
	IEEE 802.11n HT20 Mode:	18.28 dBm	(67.298 mW)
	IEEE 802.11n HT40 Mode:	15.22 dBm	(33.266 mW)
	IEEE 802.11AC HT80 Mode:	16.15 dBm	(41.210 mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A		

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	May 15, 2015	Initial Issue	ALL	Sunny Chang

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)	Result
High	2462	53.333	1.86	20	0.0198	1	Pass

IEEE 802.11g Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
Mid	2437	112.202	1.86	20	0.0416	1	Pass

IEEE 802.11n HT 20 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
Low	2412	59.293	3.72	20	0.0439	1	Pass

IEEE 802.11n HT 40 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
Low	2422	32.734	3.72	20	0.0243	1	Pass

IEEE 802.11a Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
High	5240	50.699	2.09	20	0.0211	1	Pass

IEEE 802.11n HT20 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
Mid	5785	67.298	6.21	20	0.0832	1	Pass

IEEE 802.11n HT40 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
High	5795	33.266	6.21	20	0.0411	1	Pass

IEEE 802.11AC HT80 Mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)	Result
Mid	5775	41.210	6.21	20	0.0509	1	Pass