



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	IP Micro Camera								
Model	NPC-20012-F2WL W; NPC-20012-F2WL								
Model Discrepancy	All the model numbers (list on this report) are identical, just for marketing purpose only except Color. <table><tr><th>Model Number</th><th>Color</th></tr><tr><td>NPC-20012-F2WL W</td><td>White</td></tr><tr><td>NPC-20012-F2WL</td><td>Black</td></tr></table>			Model Number	Color	NPC-20012-F2WL W	White	NPC-20012-F2WL	Black
Model Number	Color								
NPC-20012-F2WL W	White								
NPC-20012-F2WL	Black								
RF Module	TAITO YUDEN CO., LTD	Model:	WYSAAVDX7						
Frequency band (Operating)	<input checked="" type="checkbox"/> 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz 802.11n HT40: 2.422GHz ~ 2.452GHz <input type="checkbox"/> Others								
Device category	<input type="checkbox"/> Portable (<20cm separation) <input checked="" type="checkbox"/> Mobile (>20cm separation) <input type="checkbox"/> Others								
Exposure classification	<input type="checkbox"/> Occupational/Controlled exposure (S = 5mW/cm ²) <input checked="" type="checkbox"/> General Population/Uncontrolled exposure (S=1mW/cm ²)								
Antenna Specification	2.4GHz: Antenna Gain : 0.20 dBi (Numeric gain 1.05)								
Maximum Average output power	IEEE 802.11b Mode: 12.71 dBm (18.664 mW) IEEE 802.11g Mode: 6.00 dBm (3.981 mW) IEEE 802.11n HT 20 Mode 6.14 dBm (4.111 mW) IEEE 802.11n HT 40 Mode 5.72 dBm (3.733 mW)								
Maximum Tune up Power	IEEE 802.11b Mode: 13.00 dBm (19.953 mW) IEEE 802.11g Mode: 7.00 dBm (5.012 mW) IEEE 802.11n HT 20 Mode 7.00 dBm (5.012 mW) IEEE 802.11n HT 40 Mode 7.00 dBm (5.012 mW)								
Evaluation applied	<input checked="" type="checkbox"/> MPE Evaluation* <input type="checkbox"/> SAR Evaluation <input type="checkbox"/> N/A								



Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	2014/04/11	Initial Issue	ALL	



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:

$$P \text{ (mW)} = P \text{ (W)} / 1000 \text{ and}$$

$$d \text{ (cm)} = d \text{ (m)} / 100$$

Yields

$$S = \frac{30 \times (P/1000) \times G}{377 \times (d/100)^2} = 0.0796 \times \frac{P \times G}{d^2} \quad \textbf{Equation 1}$$

Where d = Distance in cm

P = Power in mW

G = Numeric antenna gain

S = Power density in mW / cm²

**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 / cm²

IEEE 802.11b mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
1	2412	19.953	1.05	20	0.0042	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	5.012	1.05	20	0.0010	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	5.012	1.05	20	0.0010	1

IEEE 802.11n HT40 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm ²	Limit (mW/cm2)
1	2412	5.012	1.05	20	0.0010	1