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47 C.F.R. Part 1, Subpart I, Section 1.1310
47 C.F.R. Part 2, Subpart J, Section 2.1091

RF EXPOSURE REPORT

For

WLAN 11b/g/n SDIO MODULE

Model: 05010TX

Trade Name: N/A

Issued to

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1309

Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 1, 2016	Initial Issue	ALL	Doris Chu

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1. 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.

2. EUT SPECIFICATION

EUT	WLAN 11b/g/n SDIO MODULE
Model	05010TX
Trade Name	N/A
Frequency band (Operating)	☒ 802.11b/g/n HT20: 2.412GHz ~ 2.462GHz ☐ 802.11n HT40: 2.422GHz ~ 2.452GHz ☐ 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	2.4GHz: Dipole Antenna Antenna Gain : 2.30 dBi (Numeric gain: 1.70)
Maximum Average output power	IEEE 802.11b Mode: 1.88 dBm (1.542 mW) IEEE 802.11g Mode: 3.61 dBm (2.296 mW) IEEE 802.11n HT 20 Mode: 2.35 dBm (1.718 mW) IEEE 802.11n HT 40 Mode: 1.40 dBm (1.380 mW)
Maximum Tune up Power	IEEE 802.11b Mode: 4.00 dBm (2.512 mW) IEEE 802.11g Mode: 5.00 dBm (3.162 mW) IEEE 802.11n HT 20 Mode: 4.00 dBm (2.512 mW) IEEE 802.11n HT 40 Mode: 3.00 dBm (1.995 mW)
Evaluation applied	☒ MPE Evaluation* ☐ SAR Evaluation ☐ N/A

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3. TEST RESULTS

No non-compliance noted.

Calculation

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

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

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

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

4. 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)
1	2412	2.512	1.7	20	0.0008	1

IEEE 802.11g mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
11	2462	3.162	1.7	20	0.0011	1

IEEE 802.11n HT20 mode:

Ch.	Frq.(MHz)	P (mW)	Gain (num.)	D (cm)	Power density in mW / cm^2	Limit (mW/cm2)
11	2462	2.512	1.7	20	0.0008	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	1.995	1.7	20	0.0007	1