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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

WHITE DRIVE BOX

Model: TB4001

Issued for

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
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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

Product Name	WHITE DRIVE BOX
Model Number	TB4001
Identify Number	T160801S01
Received Date	August 01, 2016
Frequency band (Operating)	802.11b/g/gn HT20 Mode: 2412MHz ~ 2462 MHz GSM / GPRS / EGPRS:850: 824.2 ~ 848.8 MHz GSM / GPRS / EGPRS:1900: 1850.2 ~ 1909.8 MHz
Device category	Mobile (>20cm separation)
Exposure classification	☐ Occupational/Controlled exposure (S = 5mW/cm ²) ☒ General Population/Uncontrolled exposure (S=1mW/cm ²)
Antenna Specification	WiFi 2.4GHz Antenna, Internal Chip Antenna × 1, Antenna Gain: 3.05 dBi External YAGI Antenna × 2, Antenna Gain: 3.5 dBi LTE Antenna, PCB Antenna(WAG-F-LTE5-00-009) × 1, Antenna Gain: -0.98 dBi PCB Antenna(WAG-F-LTE5-00-009) × 1, Antenna Gain: 1.82 dBi PCB Antenna(WAG-F-LTE5-00-010) × 1, Antenna Gain: 0.47 dBi PCB Antenna(WAG-F-LTE5-00-010) × 1, Antenna Gain: 1.25 dBi
Maximum average output power	Direct Mode: IEEE 802.11b Mode: 16.65 dBm IEEE 802.11g Mode: 22.07 dBm IEEE 802.11gn HT20 MCS0 Mode: 21.93 dBm STA Mode : IEEE 802.11b Mode: 16.02 dBm IEEE 802.11g Mode: 20.63 dBm IEEE 802.11gn HT20 MCS0 Mode: 19.63 dBm GSM 850: 31.62 dBm GPRS 850: 31.64 dBm EGPRS 850: 27.57 dBm GSM 1900: 30.89 dBm GPRS 1900: 30.90 dBm EGPRS 1900: 27.23 dBm

Power Target / Tolerance	GSM 850: 33 dBm $\pm$ 3 dBm GPRS 850: 33 dBm $\pm$ 3 dBm EGPRS 850: 27 dBm $\pm$ 3 dBm GSM 1900: 30 dBm $\pm$ 3 dBm GPRS 1900: 30 dBm $\pm$ 3 dBm EGPRS 1900: 26 dBm $\pm$ 3 dBm		
Max tune up Power / Max time Average Power	System	Max Tune up Power	Time Average Power
	GSM850	36.0dBm (3981.072mW)	27.0dBm (501.187mW)
	GPRS850	36.0dBm (3981.072mW)	27.0dBm (501.187mW)
	EGPRS850	30.0dBm (1000.000mW)	21.0dBm (125.893mW)
	GSM1900	33.0dBm (1995.262mW)	24.0dBm (251.189mW)
	GPRS1900	33.0dBm (1995.262mW)	24.0dBm (251.189mW)
	EGPRS1900	29.0dBm (794.328mW)	20.0dBm (100.000mW)
Evaluation applied	MPE Evaluation*		

Remark:

1. For more details, please refer to the User's manual of the EUT.
2. This submittal(s) (test report) is intended for FCC ID: MCLTB4001 filing.

3. Test Results

No non-compliance noted.

Calculation

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

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:

$$S = \frac{30 \times P \times G}{3770d^2}$$

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

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 / cm²

Mode	Frequency (MHz)	Power (dBm)	Ant. Gain (dBi)	Distance (cm)	Power density (mW/cm ²)	Limit (mW/cm ²)
IEEE 802.11b	2462	16.65	3.5	20	0.0206	1
IEEE 802.11g	2462	22.07	3.5	20	0.0717	1
IEEE 802.11gn HT20 MCS0	2462	21.93	3.5	20	0.0695	1
GSM 850	824.2	27	1.82	20	0.1516	0.5495
GPRS 850	836.6	27	1.82	20	0.1516	0.5577
EGPRS 850	836.6	21	1.82	20	0.0381	0.5577
GSM 1900	1880.0	24	1.82	20	0.0760	1.2533
GPRS 1900	1909.8	24	1.82	20	0.0760	1.2732
EGPRS 1900	1909.8	20	1.82	20	0.0302	1.2732

Simultaneously MPE

Simultaneously MPE = MPE 1 / Limit 1 + MPE 2 / Limit 2 +

WiFi 2.4GHz + 2G Mode

Simultaneously MPE = $(0.0717 / 1) + (0.1516 / 0.5577) = 0.3435 \text{ mW/cm}^2$